CERAMIC ABSTRACTS and THE BULLETIN

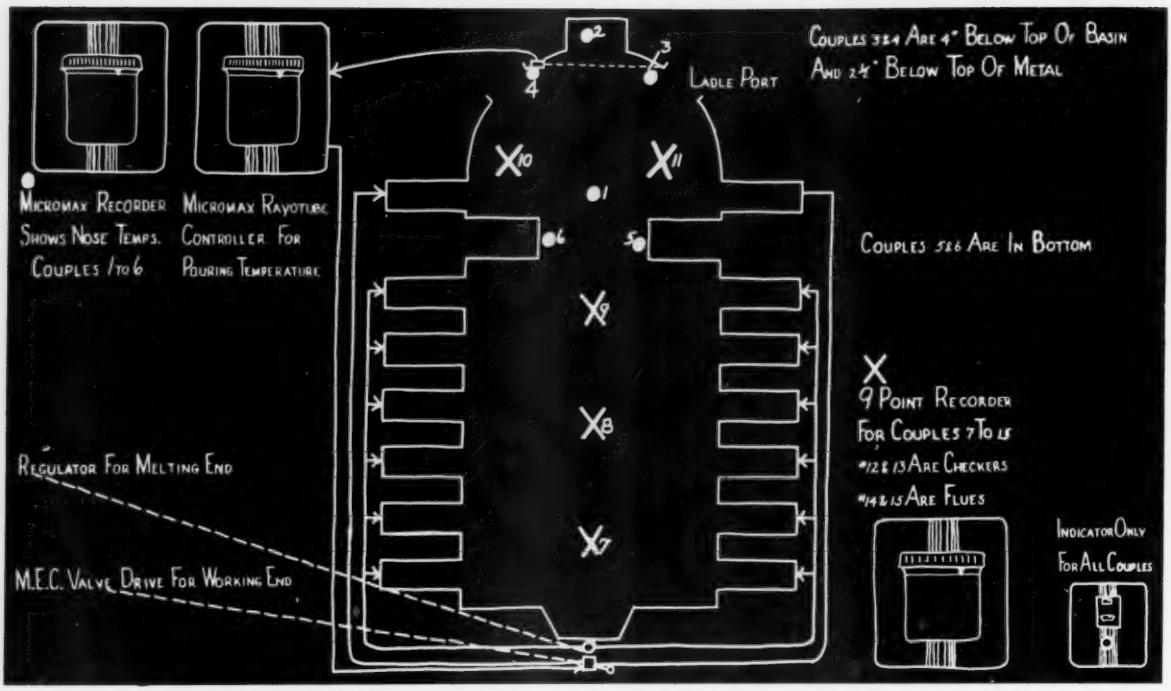
OF THE

AMERICAN CERAMIC SOCIETY

OCTOBER 15, 1945

MONTHLY PUBLICATION DEVOTED TO THE ARTS AND SCIENCES RELATED TO THE SILICATE INDUSTRIES

MEMBERSHIP ROSTER


Couples 3 & 4 Are 4" Below Top Of Basin And 2½" Below Top Of Metal
Ladle Port
Micromax Recorder Shows Nose Temps. Couples 1 to 6
Micromax Rayotube Controller For Pouring Temperature
Couples 5 & 6 Are In Bottom
9 Point Recorder For Couples 7 To 15
#12 & 13 Are Checkers
#14 & 15 Are Flues
Indicator Only For All Couples
Regulator For Melting End
M.E.C. Valve Drive For Working End

In addition to wired glass, Mississippi Glass Co. produces figured, skylight, corrugated and polished plate and "Coolite" heat-resistant glasses. The tank uses Micromax and L&N Optical Pyrometers as shown above and described below.

HOW MISSISSIPPI GLASS CONTROLS TEMPERATURE with MICROMAX PYROMETERS

Because Mississippi Glass Co. makes various kinds of ware, the tank in the St. Louis plant must be able to supply metal at correspondingly varied temperatures. The range is approximately 2050 to 2450 F. The highlight of the Control System is that it's based directly on the ready-to-work temperature of the metal, secured as follows:

The Micromax Pyrometer which regulates nose temperature uses as its detector a Rayotube radiation-receiver. This is sighted at the metal alongside a ladle port, so that it catches the true discharge temperature. Moreover, Rayotube's time lag is only a fraction of a second, so that the temperature is always up to the instant. And the Controller is so micro-responsive that it acts with utmost promptness in adjusting the fuel supply to balance the slightest Rayotube-detected fluctuations.

The other temperature facts needed from the tank's nose are supplied by the 6-point Recorder shown, and by an L&N Optical Pyrometer. The 9-point Recorder and the Optical are used in holding melting temperatures in line, balancing the temperatures, and so on.

Compact, complete catalogs on Micromax and Optical Pyrometers will of course be sent on request, but if you have a specific problem, we suggest you call in our engineering service—by mail or in person, as you prefer.

Melter looks at Micromax Controller which regulates nose temperature detected by Rayotube.

LEEDS & NORTHRUP COMPANY, 4990 STENTON AVE., PHILA., PA.

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MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

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THE SCIENTIFIC COUNTER-CURRENT RAPID BATCH MIXING SYSTEM

"Lancaster's" Mixing Precision . . .

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Discharge Valve Fully Opened. The mixing plows sweep directly across this opening, effecting quick and clean discharge.

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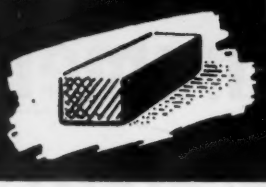
FOR AUTOMATIC MANUFACTURE



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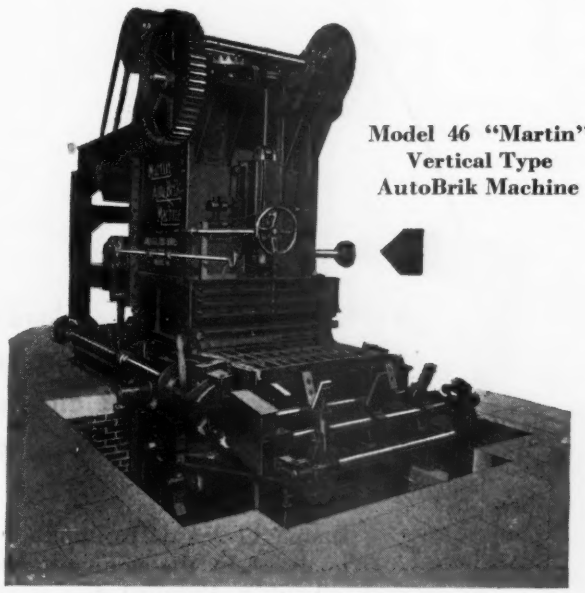
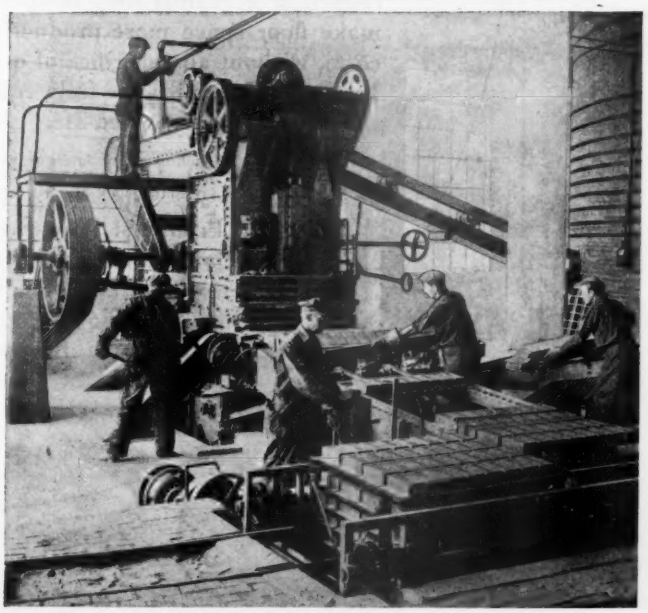


Model 46 "Martin" Vertical Type AutoBrik Machine



"Lancaster" AutoBrik Machine and Automatic Pallet Car Loader. 50,000 to 100,000 bricks per day—molded; dumped onto pallets; loaded on dryer cars; and cars delivered to driers by only 6 men on the equipment.

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. . . Increases Production

. . . Lowers Shop Costs

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Inland research has given the porcelain enameling industry a new alloy steel base—TI-NAMEL—which eliminates the standard cobalt ground coat

Inland TI-NAMEL simplifies shop operations by its superior forming qualities, by the elimination of ground coat operations, and by the reduction of enamel shop re-operations, edging, and scrap. These factors make floor space more productive, increase output, and cut manufacturing costs, without any sacrifice of quality. Finished products made of Inland TI-NAMEL are fully equal to the best multi-coat ware and they have longer service life.

Pending patent applications on the new enameling process and products made thereby are owned jointly by Inland Steel Company and Titanium Alloy Manufacturing Company under trust agreement.

Principal Products: Bars, Structurals, Plates, Sheets, Strip, Tin Plate, Floor Plate, Piling, Reinforcing Bars, Rails, Track Accessories. Inland Steel Company, 38 S. Dearborn St., Chicago 3, Ill. Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND TI-NAMEL

Cronin China Co's. "Romance" Pattern breathes the beauty and abundance of eager yielding America in a motif as heart-warming as grain waving fields and flower gladdened gardens.

"How Perfectly Lovely"

Stubenville Pottery Co's. "Dogwood" Pattern comes to the table with all the spirit lifting freshness of a sun-blessed, soft, warm day in blossom-bursting Spring.

All over America, thrilling acts in a great National Drama are being staged in stores and departments whose keen buyers have been quick enough, and sensitive enough, to recognize the rather suddenly arrived, dominating preference of American housewives for chinaware patterned to life as they live it.

As we watch shoppers lift daintily crafted pieces, we hear them exclaim, "How *perfectly lovely*!"..."Isn't *that* a *sweet* pattern?"..." Quaint as a Salem Street, isn't it?" . . . all of which is satisfying reward for the persistence which brought American chinaware, not merely to point of acceptance, but which lifted it to a level of preference.

ELECTRO (patented) FLOATING Construction Kiln Furniture has contributed, not only importantly, but little less than absolutely, to achievement by American potters of production which now promises development of a great industry to dominate the domestic market and to compete successfully in foreign markets.

The elements to make it an important factor in national economic growth and stability, have been achieved. All we need now is the cooperation of American buyers and the applied ability of retail merchandisers to achieve true greatness for this industry, to create new jobs . . . new wealth.

May we send explanatory, illustrated literature or, better still, one of our Ceramic Engineers to explain how our furniture permits manufacture in thin sections, reduces cracking and sagging, and assures so large a percentage of first quality production that competition in any price class may be confidently undertaken?

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A vital contribution to the new characteristics and forms of high-grade glass has been made by SOLVAY Potassium Carbonates. Their outstanding superiority of granulation and purity are acknowledged by glass manufacturers. If you have an idea for new high-grade glass, use high-grade SOLVAY Potassium Carbonates.

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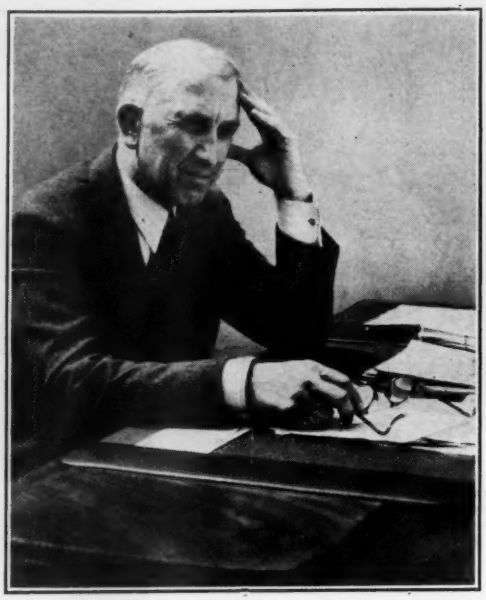

MAYBE WE CAN HELP

If its porcelain enameling that you are worrying about, maybe we can help. We have been manufacturing and using Ing-Rich ground coat and cover coat frits for over 44 years, and we may have some practical answers for your problems.

Why don't you contact us now—no obligation, of course.

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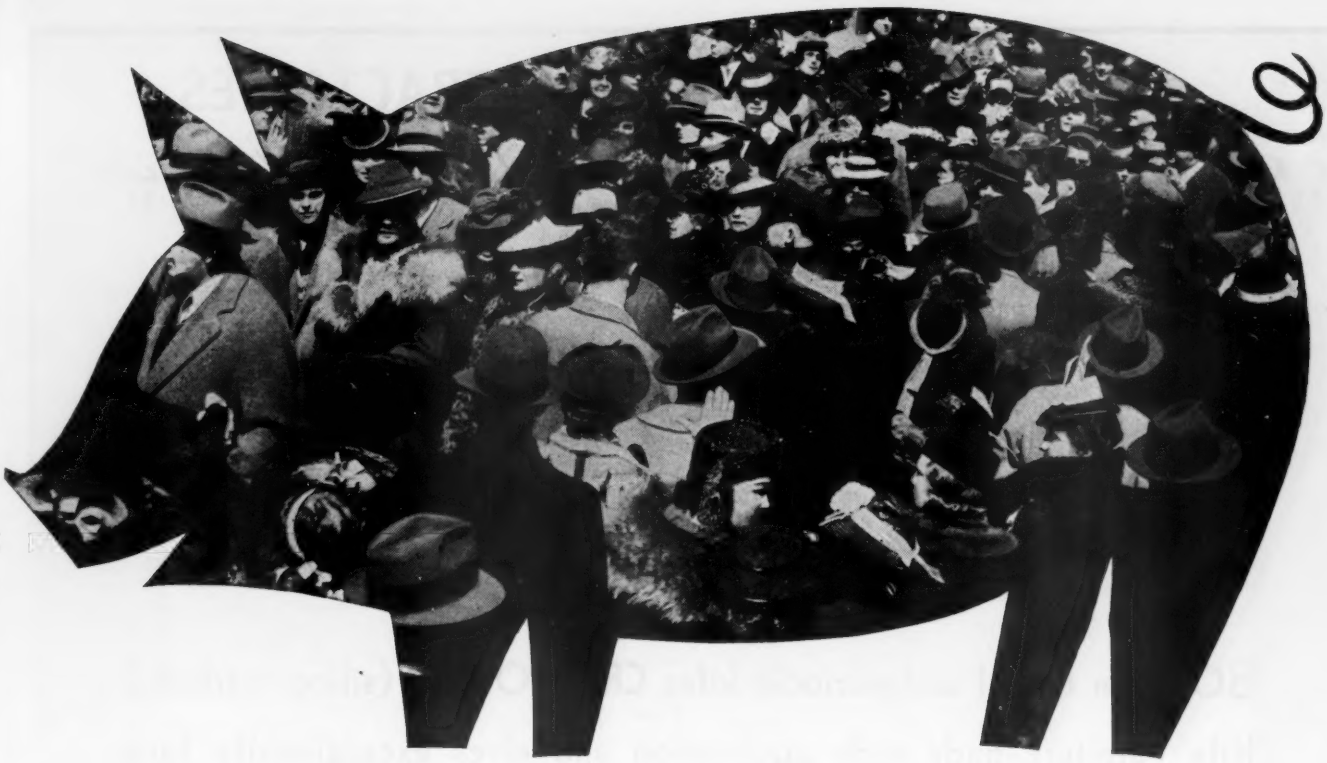

TO MARKET, TO MARKET . . .

to buy a fine pig . . . a range to cook it in and a refrigerator to keep it. Seriously, millions of families will be in the market for long-needed porcelain enameled appliances.

THEIR ACCEPTANCE of the advantages of porcelain enamel has been kept alive right *through the war years* by Armco national advertising. In fact, this Armco educational advertising extends back to 1914—when people first became familiar with the Armco triangle trademark as a mark of metal excellence. These 31 continuous years of advertising will pay dividends to you in the post-war markets ahead.

EXPERIENCE is the second of the "Big 4" advantages you get when you do business with Armco. The first special enameling iron for commercial use was made by Armco. It has been constantly improved right up to the present day.

SERVICE on every problem is an Armco feature that enamelers have long relied upon. Trained Armco service men help them answer many difficult questions on design and production. Behind these specialists is the largest research organization in the flat-rolled steel industry. Current developments in these Armco laboratories will offer much to the enameling industry.

MERCHANDISING AID. The fourth logical step in the complete Armco service is close co-operation with customers in the actual marketing of products. Armco has helped educate the sales staffs of its customers and their distributing outlets; and has supplied valuable sales and advertising aids.

These "Big 4" advantages will again be available to your production and salesmen in the years ahead. The American Rolling Mill Company, 2221 Curtis Street, Middletown, Ohio.

FOR EXPORT: THE ARMCO INTERNATIONAL CORPORATION

THE AMERICAN ROLLING MILL COMPANY

SPECIAL-PURPOSE SHEET STEELS

BOTH in tunnel and periodic kilns CRYSTOLON (silicon carbide) Kiln Furniture finds wide application and gives exceptionally long service. Batts, setter tile and supports of CRYSTOLON are mechanically strong and therefore can be made in very thin cross-section for efficient operation and saving of valuable kiln space. They will carry a load without deformation and have exceptional resistance to cracking and oxidation. CRYSTOLON batts, having a patented slotted construction, will not crack from heat stresses the way conventional types do. CRYSTOLON saggers, because of their great strength, can be made with thin construction thereby passing heat quickly to the ware and economizing on kiln space. Use CRYSTOLON products throughout the entire kiln setting and benefit from the advantages of this material: high refractoriness, thin cross-section, resistance to warping and to spalling from thermal shock.

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Jooste Lepidolite Available in Large Tonnages

Within the last year, Jooste Lepidolite was made available for the first time in large commercial quantities. Since then the tonnage and the number of users has shown a surprising increase primarily because of its extended use in glass, glazes and enamels.

Lepidolite exerts the most powerful fluxing effect of the Lithium minerals. For this reason it is largely used in glass melting in the manufacture of opal and heat-resisting glasses.

The fluxing properties of Jooste Lepidolite stem from high percentages of potash, rubidia and fluorine in addition to Lithium.

In glass, Jooste Lepidolite is an easily melted source of alumina. The instrinsic value of its individual components is of increasing economic interest in less expensive glass products. Low iron content makes it especially attractive in glasses which cannot tolerate iron discoloration.

Jooste Lepidolite has proved a valuable ingredient in leadless and low lead dinnerware and pottery *glazes*.

It has established itself in many *enamel* operations where its active fluxing character is of value and its alumina can be tolerated.

The acceptance of Jooste Lepidolite has been justified by the uniform high quality of the ore, flexible processing facilities and the many services Foote is able to offer to assure customers a sound source of supply of consistently superior Lepidolite which meets all chemical and physical specifications. A typical chemical analysis of Jooste Lepidolite follows:

SiO_2	49.36%	K_2O	9.28%
Al_2O_3	28.98%	MnO	0.30%
Fe_2O_3	0.08%	SnO_2	0.18%
Li_2O	4.20%	Cr_2O_3	trace
Rb_2O	2.20%	Fluorine	4.00%
Na_2O	1.94%		

Movement of large tonnages of Jooste Lepidolite can be established promptly, ground to your particular free-flowing and dust free granulation or airfloated.

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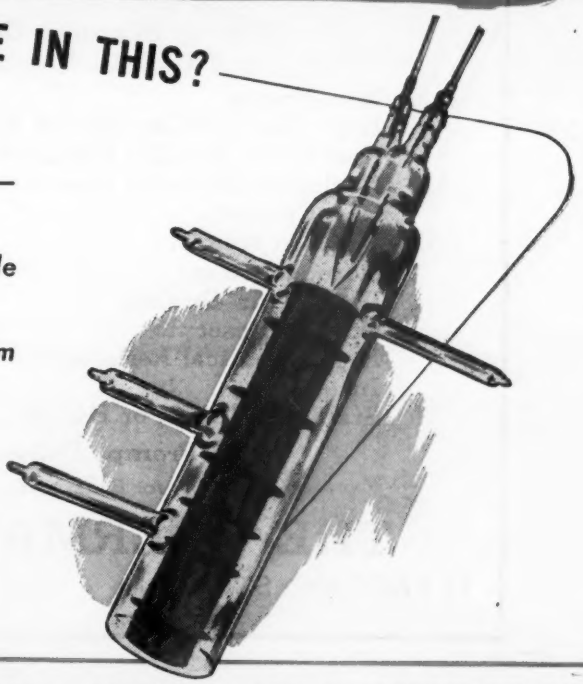

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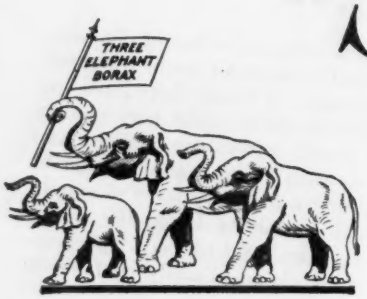

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Acid Resisting—for table and laboratory glass ware.

Alkali Resisting—brilliant and opaque qualities are retained after repeated washing in strong alkali solutions. For beverage and milk bottles.

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Write or wire today. We want to tell you more about our colors. We can help you produce better Glass Ware.

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Ceramics • Luting Mud
Refractories • Glass Batching
Refractory Cements

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INDUSTRY today pays off on *performance*. When we repeat that the best, fastest, least expensive way to mix many ceramic bodies is with a Simpson Mixer, we can point to Simpson Mixers doing just that. We know from experience in the field that the Simpson principle of mixing by mulling produces a more uniform mixture—resulting in a stronger body which lends itself to more accurate and delicate shaping.

The perfect mixing that results from mulling in a Simpson saves time by eliminating blunging, filter pressing or remixing. And the mixing time (4 to 10 minutes for most ceramic materials) is less that of any other method.

Users can tell you that—because they mix better—Simpson Mixers reduce the number of rejects. They will tell you also that Simpsons require less labor, use less power, require very little maintenance.

Find out how a Simpson will help solve *your* mixing problems. Ask to have a National engineer call and tell you the Simpson story.

And now—a second white star has been added to our Army-Navy Production Award Flag—for continued production achievement.

NATIONAL ENGINEERING COMPANY

MACHINERY HALL BUILDING • CHICAGO, ILLINOIS

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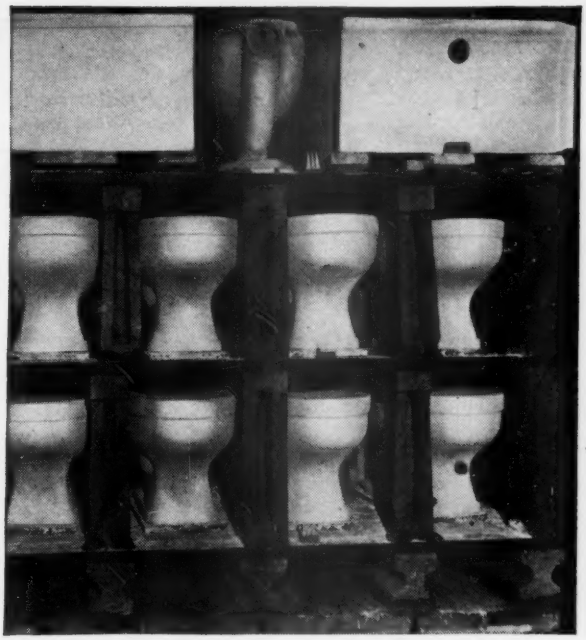
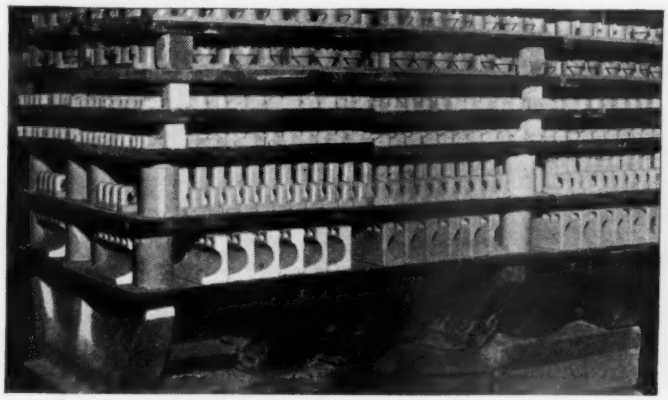
FOR GREATER PRODUCTION
IMPROVED QUALITY
LOWER COST
USE



When burning sanitary ware . . .

The high hot strength of "CARBOFRAX" silicon carbide setter tile permits the use of relatively thin tile . . . and the car can be loaded to greater capacity. Heat is quickly and evenly distributed through the tile. Ware is uniformly burned.



When firing electrical porcelain . . .

"CARBOFRAX" tile are unaffected by elevated temperatures. A short firing cycle is less harmful to this super refractory than to other materials. Freedom from sagging and resistance to cracking assure long life.

When making ceramic cooking and ovenware . . .

"CARBOFRAX" setters remain clean and stay free from excessive warpage. Ware rejections due to warping and discoloration are materially reduced. With bigger loadings, production is boosted and burning costs lowered.

And when burning abrasives—steatite—insulators—vitrified hotel ware—art ware . . . Regardless of the type of ware you handle, "CARBOFRAX" setter tile promote operating economy. They boost production . . . lower fuel consumption . . . and reduce setter cost. It will pay you to investigate the advantages gained with the use of "CARBOFRAX" tile in *your* kilns!

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Dept. B-5
Refractories Division
Perth Amboy, N. J.

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Some Advantageous uses of Borax and Boric Acid

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The importance of Borax and Boric Acid as constituents in glaze and enamel compositions, is well recognized in the ceramic and enamelling industries.

- Low fusing of borate containing enamels, guards against excessive warping of the ware.
- Borax imparts a brighter glistening finish and assists in obtaining deep brilliant colors.
- Borax imparts toughness, durability and resistance to mechanical strains.
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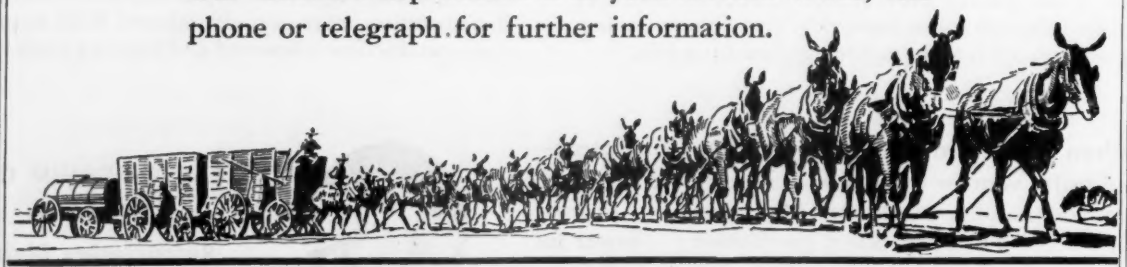
Good acid-resisting clear enamels may be obtained if proper $B_2O_3:SiO_2$ molecular ratio is maintained in the composition.

Our technical department is at your service. Write, telephone or telegraph for further information.



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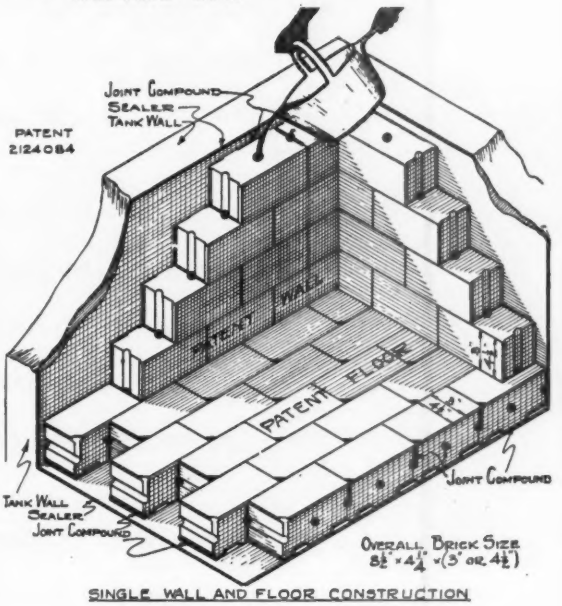

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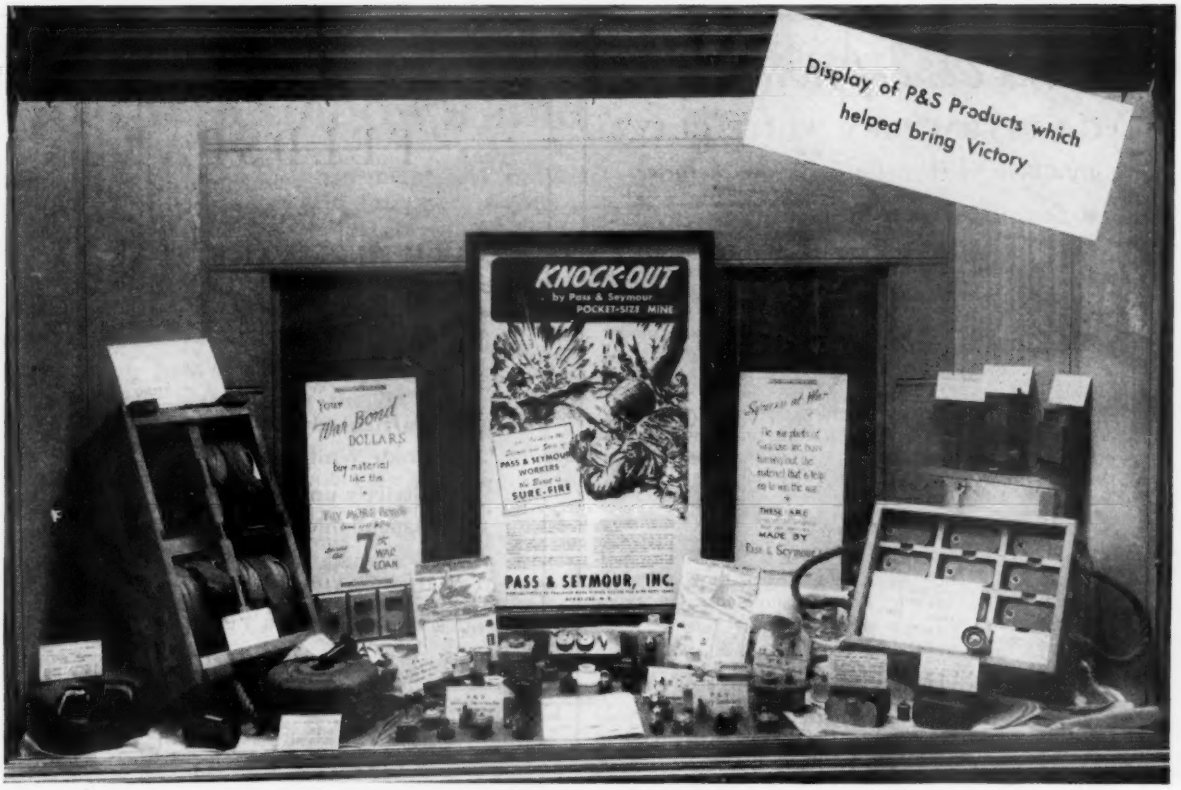

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SAVE in time, materials, fuel, man-power; minimize spoilage and guarantee a better, more uniform product.

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Bulletins 43-552 and 43-591 explain the application of Instruments and Controllers to Ceramic furnaces, Glass tanks, Pottery kilns and Enameling furnaces with schematic drawing of a complete system of Automatic Control of Combustion and Pressures—sent free upon request.

SPECIAL NOTE! Be sure to send for your Free Copy of Bulletin 43-552 "Instrumentation and Control of Ceramic Furnaces, Pottery Kilns, Glass Tanks and Enameling Furnaces."

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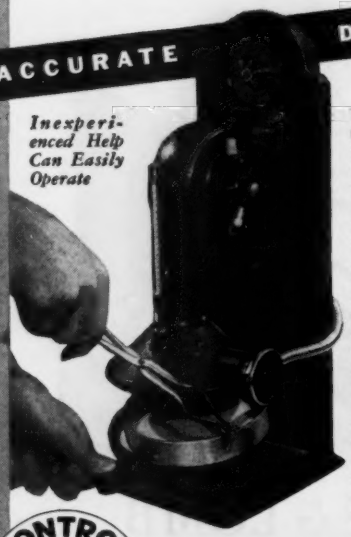

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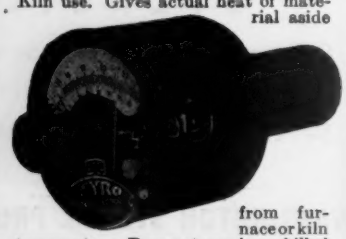

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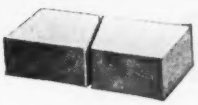
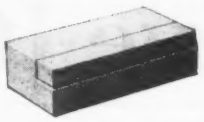
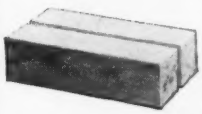


This acid brick intended for a chemical plant acid chamber was cut completely in two, in just 37 seconds.

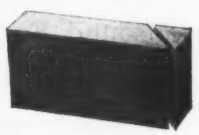
One of many intricate cuts performed on first quality clay brick for heat treating furnaces. Made in 8 sec.





Silica brick cut lengthwise for open hearth furnace work, only 9 seconds were required to complete this cut!

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds.



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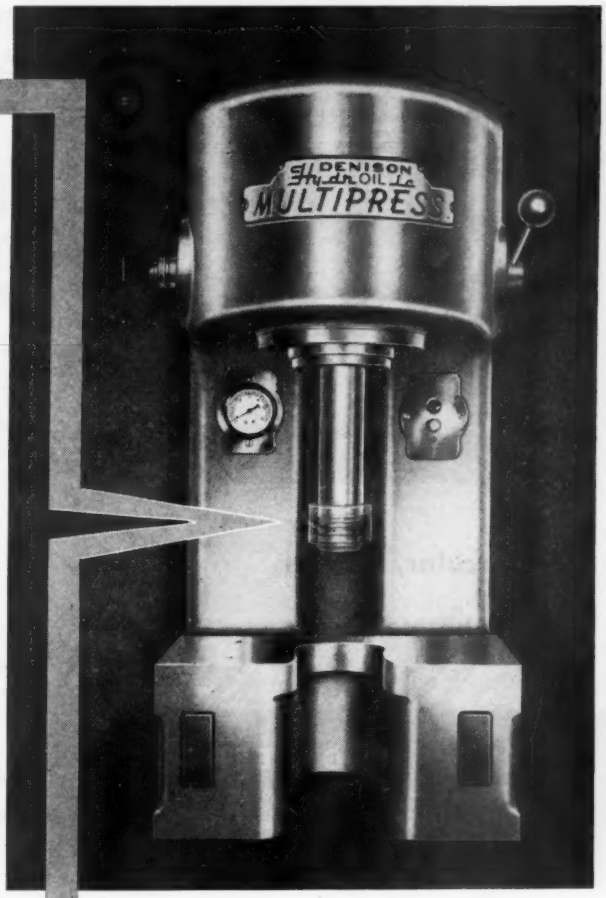

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OPERATING DAYS	934
IDLE DAYS	131
TOTAL DAYS	1,065
SQ. FT. MELTING AREA	392
TOTAL TONS GLASS PRODUCED	61,415
TONS PER SQ. FT. PER LIFE	157
SQ. FT. PER TON PER OPERATING DAY	5.96

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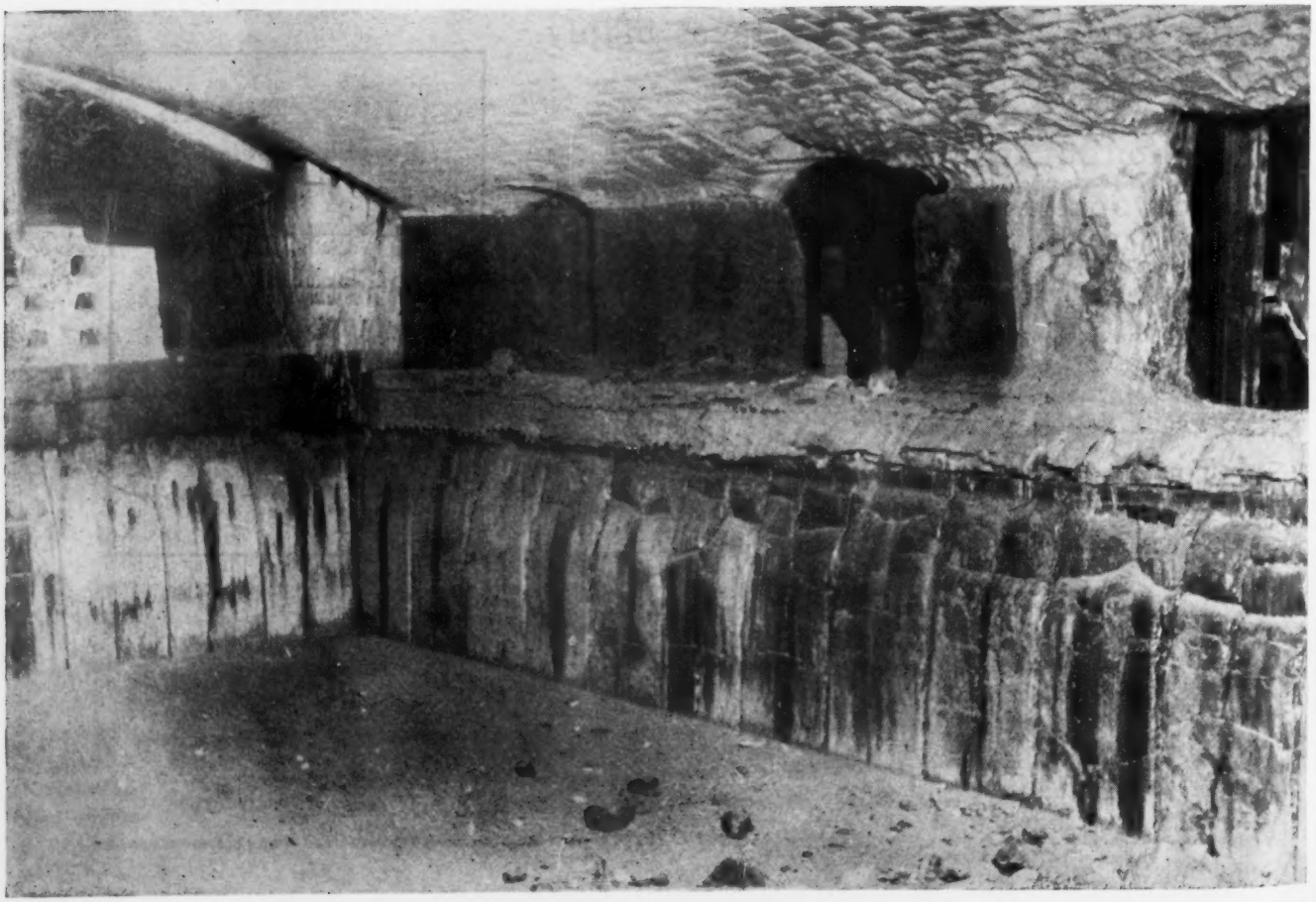

Ceramic Abstracts Section

Compiled by

THE AMERICAN CERAMIC SOCIETY

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Vol. 24 **October 15, 1945** **No. 10**

Abrasives

High speed grinding wheels from Mysore corundum. P. S. RAJA RAO. *Trans. Indian Ceram. Soc.*, **3** [1] 42–48 (1944).—R. sees little reason for India to hesitate to develop the grinding-wheel industry when the deposits of corundum are abundant. It occurs as "a finely granular light gray rock" near Pataraknang and other localities in Khasi and Jaintia Hills, Assam; at Pipra in Rewa State; and in Anantapur, Coimbatore, South Kanara, and Salem Districts of the Madras Presidency. In Mysore State it is found in the altered granites and pegmatite rocks. The output of corundum in Mysore from 1900 to 1914 amounted to 21,609 cwt. valued at Rs. 93,059. Of the associated impurities, black mica, feldspar, amphiboles, diaspore, garnets, and tourmaline, quartz is strikingly absent. The pure corundum with its higher specific gravity, 3.92, is obtained from the ore by the use of jigs and percussion tables. R. outlines the properties, sizing, and classification of abrasive grains, the different types of bonds, and the grading of finished wheels. He describes experiments with Indian materials to prove their adaptability to home manufacture. Two varieties of corundum were used: (*a*) gray corundum from Hornahalli and (*b*) pink corundum in loose crystals from Sringeri Estate. The material was crushed in a mortar and graded with sieves, which were shaken in a bamboo winnower, commonly used locally for separating stones from corn. For the bond, a series of compositions representing Seger cones was composed from Gollahalli kaolin, Settihalli feldspar, quartz, and marble. The test wheels were satisfactory except for surface wear, which was not uniform because of hand molding. The cost of manufacture of the test wheels was half the price of imported wheels. M.E.P.

Using abrasive cut-off wheels. F. A. UPPER. *Foundry*, **71** [10] 115, 193–95 (1943).—U. discusses the selection and proper use of cut-off wheels. See *Ceram. Abs.*, **23** [11] 183 (1944). F.G.H.

PATENTS

Aluminous abrasive material. H. N. BAUMANN, JR., AND C. E. WOODDELL (Carborundum Co.). U. S. 2,383,035, Aug. 21, 1945 (Oct. 18, 1944). 6 claims. Cl. 51-309.—1. Aluminous abrasive material, comprising by chemical analysis at least 90% crystalline aluminum oxide, and a matrix consisting principally of a silicate of the group consisting of beryl and zircon, each crystal of the material having a microstructure characterized by approximately parallel planes of matrix material bounding parallel columns, oriented lengthwise in the direction of the *c*-axis of the crystal, of microcrystals of alpha-alumina.

Apparatus for internal grinding. R. A. HEALD (Heald Machine Co.). U. S. 2,382,311, Aug. 14, 1945 (April 13, 1942). 6 claims. Cl. 51-48.

Centerless grinding machines. A. SCRIVENER, LTD., AND A. SCRIVENER. Brit. 570,793, Aug. 1, 1945 (Feb. 24, 1944).

Dust collector for grinding, etc., machines. C. H. ANTRIM (Hammond Machinery Builders, Inc.). U. S. 2,384,414, Sept. 4, 1945 (Oct. 26, 1942). 9 claims. Cl. 183-37.

Form crushing of abrasive wheels. G. F. EGLINTON (Lincoln Park Industries, Inc.). U. S. 2,384,289, Sept. 4, 1945 (Nov. 3, 1943). 7 claims. Cl. 125-11.

Guard for emery wheels, etc. ANDREW FLOHR AND A. J. FLOHR. U. S. 2,384,243, Sept. 4, 1945 (Feb. 16, 1944). 7 claims. Cl. 51-269.

Honing device. J. B. KLEIN (Micromatic Hone Corp.). U. S. 2,383,657, Aug. 28, 1945 (May 22, 1943). 5 claims. Cl. 51-184.3.

Machines for grinding drills, etc. D. T. E. FIELDING. Brit. 570,229, July 11, 1945 (May 15, 1944).

Manufacture of abrasive articles. D. B. SHARPE (Carborundum Co.). U. S. 2,383,519, Aug. 28, 1945 (June 27, 1944). 8 claims. Cl. 51-297.—1. The method of making an abrasive article having a cylindrical-shaped bonded abrasive body from a plurality of superimposed sheets of felted fibrous abrasive-containing web material.

Manufacture of grinding and cutting tools with grinding grains electrolytically fastened to a metallic carrier. FRANZ SEDLÁČEK. Ger. 743,204, Dec. 20, 1943 (Feb. 9, 1941); cl. 67*c*; abstracted in *Chem. Zentr.*, **1944, II** [3/4] 152.—To make the carrier with diamond or other grains on both sides, the grains are placed on a metal plate, which is provided with grooves, recesses, etc., and serves as a cathode, and are then connected with one another by electrolytic depositions. Other layers of grinding grains

are then laid upon this deposit and again connected by electrolytic deposition until the tool has the final shape. M.HA.

Method and means for cutting off material abrasively. H. G. ROBINSON (American Chain & Cable Co., Inc.). U. S. 2,383,741, Aug. 28, 1945 (July 28, 1943). 8 claims. Cl. 51-33.

Production of abrasive tools. L. NUSSBAUM AND H. ATTARI. Brit. 570,805, Aug. 9, 1945 (April 29, 1943).

Wire grinding machine. C. A. CARLSON (Norton Co.). U. S. 2,383,927, Aug. 28, 1945 (July 15, 1944). 11 claims. Cl. 51-90.

Art and Archeology

American ceramics—worth fighting about and for. GLEN LUKENS. *Ceram. Ind.*, **45** [2] 72–76 (1945).—The potentialities of American potteries both for domestic and export markets are discussed, and it is believed that small potteries which grew during the war may survive if they get cooperation from the merchandisers. H.T.

Art—an important factor in inter-American friendship. FEDERICO ELGUERA. *Design*, **45** [3] 4–6 (1943).—The essential qualities of true Pan-Americanism are those which constitute a good neighbor, mutual understanding and, through such understanding, a sympathetic appreciation of the other's point of view. The arts are an ideal means for establishing such an understanding, for art is a universal language. Much can be learned of Peru from the pottery of the Nazca and the Chimu peoples. 4 illustrations. L.S.

California crafts. ANON. *Design*, **45** [9] 12–13 (1944). —8 illustrations. L.S.

Ceramic art at the University of Southern California. ANON. *Design*, **45** [9] 19 (1944).—Probably no one has contributed more to American education in the field of ceramic art than Glen Lukens, head of the art department at the University of Southern California. L.S.

Ceramic Art Production Laboratory. ARTHUR E. BAGGS. *Ohio Ceram. Inds. Assn. News Letter*, **16** [6] 4 pp. (June 26, 1945); reprinted in *Bull. Amer. Ceram. Soc.*, **24** [9] 324–25 (1945).

Ceramics at Newcomb College. KENNETH E. SMITH. *Design*, **46** [4] 8–9 (1944).—Newcomb College has long been known for its excellence in ceramics and is still a leading influence in that art. 4 illustrations. L.S.

Clay. JESSIE TODD. *Design*, **46** [1] 11 (1944).—Although clay is the least used art medium in public schools, it is the most popular because out of it the child can make anything he likes. 1 illustration. L.S.

Crafts function in teacher education. L. L. GORE AND KATHERINE REED. *Design*, **46** [4] 18–19 (1944).—The specialized function of crafts at George Peabody College for Teachers, Nashville, Tenn., is to educate prospective teachers in the field of industrial arts, home economics, physical education, and occupational therapy. 4 illustrations. L.S.

Craftsmen of the mountains. ELOISE ROORBACH. *Design*, **45** [2] 17 (1943).—Two craftsmen, George Dennison and Frank Ingerson, are doing fine enamel work in the Santa Cruz mountains of California. L.S.

Handicrafts in New England. ANON. *Design*, **45** [4] 12–15 (1943).—There was a time in New England when more than 90% of everything the country family used was produced on the farm. Today the percentages are nearly reversed. Rural New Englanders, however, are making a surprising number of things by hand. Many of these were recently exhibited at the Worcester Art Museum. 7 illustrations. L.S.

High school ceramic students create for industry. ANON. *Design*, **45** [5] 8–9 (1944).—Art training received by students in a high school at Glendale, Calif., is being put to use with the chance for financial benefits. Pupils have competed in the clay-modeling contest sponsored by Schlesinger Productions. 3 illustrations. L.S.

Kansas crafts and craftsmen. THELMA PENCE. *Design*, **44** [9] 16–17 (1943).—Native-born Kansas craftsmen are winning prizes in national competitions. 1 illustration. L.S.

Mexico through her arts. MARGARET CHYNOWETH CASH. *Design*, **44** [10] 11–13 (1943).—Much of the Mexican art of today is produced for the tourist trade, but a few fine craftsmen still survive. 4 illustrations. L.S.

Oregon ceramic studio. RACHEL SMITH GRIFFIN. *Design*, **45** [9] 20–21, 24 (1944).—This Portland art project, depending on community support and staffed by volunteer workers, was conceived as an educational ideal. It offers three services, viz., the selling of craft work, the firing and glazing, and the sale of materials. 3 illustrations. L.S.

Pennsylvania handicrafts. ANON. *Design*, **46** [5] 8–11 (1945).—Considerable progress has been made in organizing and developing interest in Pennsylvania handicrafts. A motion picture on pottery making is being prepared. 6 illustrations. L.S.

Photoceramics—possibilities unlimited. ANON. *Ceram. Ind.*, **45** [1] 68 (1945).—A short description is given of a photoceramic process developed by Giuseppe Cannata of Fratelli Cannata, Chicago, whereby photographic reproductions are made on china, glass, and porcelain enamel. 2 illustrations. H.T.

Pottery making in the Southwest. ANON. *Design*, **45** [4] 6–7 (1943).—Nearly all Pueblo Indian women are potters because making pottery is one of their household tasks. 7 illustrations. L.S.

Pottery production in a rural county. JOHN C. AYRES. *Design*, **45** [4] 18–19 (1943).—In Stanislaus County, Calif., every child in the rural schools was given an opportunity to make pottery. The program was successful, although carried out with minimum equipment. 4 illustrations. L.S.

Rookwood Pottery—outstanding producer of American artware. ANON. *Ceram. Ind.*, **45** [2] 68–70 (1945).—A short description of some of the outstanding achievements of Rookwood Pottery, Cincinnati, is given. 14 illustrations. H.T.

Seattle craftsmen. ANON. *Design*, **45** [9] 10 (1944).—3 illustrations. L.S.

Use of wood ash in a low-fire mat glaze. HALDON L. THURN. *Jour. Amer. Ceram. Soc.*, **28** [9] 261–64 (1945).—3 references.

BOOKS

Crafts for Fun. EVADNA KRAUS PERRY. William Morrow & Co., Inc., New York. 278 pp., 155 illustrations. Price $3.00. Reviewed in *Design*, **45** [4] 25 (1943). L.S.

Modelling for Amateurs. CLIFFORD AND ROSEMARY ELLIS. Studio Publications, Inc., 381 Fourth Ave., New York. 78 pp. Price $1.00. Reviewed in *Design*, **46** [2] 24 (1944). L.S.

PATENTS

Burnish gold. K. H. BALLARD (E. I. du Pont de Nemours & Co.). U. S. 2,383,704, Aug. 28, 1945 (Jan. 22, 1944). 10 claims. Cl. 106-1.—1. A burnish gold preparation which comprises metallic gold, metallic silver, and powdered sulfur.

Glaze for ceramic objects for temperatures between 880° and 1050°C. DEUTSCHE GOLD- UND SILBER-SCHEIDEANSTALT VORM. ROESSLER. Fr. 876,138, Oct. 28, 1942 (Oct. 21, 1941); abstracted in *Chem. Zentr.*, **1943, I** [20] 2129.—The glaze consists mainly of K_2O, ZnO, and SiO_2 and has the following SiO_2 and K_2O contents:

SiO_2(%)	K_2O(%)
50–55	12–21
55–60	11–21
60–65	9–21
65–70	8–21
70–75	7–21
75–80	10–18

ZnO can be replaced up to one third by BaO, CaO, BeO, La_2O_3, etc. SiO_2 can be replaced up to one fourth by Na_2O, up to 2.5% of the total glaze by Al_2O_3, and up to 4% by ZrO_2 and TiO_2. M.HA.

Manufacture of objects of metallic appearance. GIULIO MARELLI. Ital. 390,008, March 29, 1941; abstracted in *Chem. Zentr.*, **1943, I** [20] 2129.—A mixture of bronze powder (**I**), glass sand (**II**), lead oxide (**III**), copper oxide (**IV**), and a refractory filler (**V**) is made up with about 20% water, molded, heated to about 320°C., and slowly cooled. Example of composition of the mass: 10 **I**, 50 **II**, 1 **III**, 1 **IV**, and 38% **V**. M.HA.

Cements

Alumina-rich cement. GABRIEL A. ASHKENAZI. *Cement Lime Manuf.*, **14,** 134–39 (1941); abstracted in *Chem. Zentr.*, **1943, II** [13] 1219.—A survey of the literature on alumina-rich cement is presented, dealing with history, resistance to attacks by solutions, heat of hydration, refractoriness, preparation of alumina-cement concrete, and chemical composition. See *Ceram. Abs.*, **23** [1] 5 (1944). M.HA.

Portland cement dispersion by adsorption of calcium lignosulfonate. FRED M. ERNSBERGER AND WESLEY G. FRANCE. *Ind. Eng. Chem.*, **37** [6] 598–600 (1945).—The results of turbidity tests on Portland cements suspended in an aqueous medium, with and without addition of calcium lignosulfonate, as obtained with the Wagner turbidimeter, show that the addition agent disperses the suspended cement particles. In the tests reported, the degree of increase in turbidity for two types of Portland cement in an aqueous medium is shown to be a function of the amount of adsorbed dispersing agent. It may be concluded that the mechanism of dispersion involves the positive adsorption of lignosulfonate anions by the cement particles. The determination of an adsorption isotherm for calcium lignosulfonate and Portland cement suspended in water is described; data are given for a typical cement. 7 references, 1 figure. F.G.H.

Precision founding. FRANCIS DITTMAR. *Iron Age*, **156** [4] 70–73 (1945).—The method of mixing and preparing three commercial grades of plaster for use in molds is described. Consideration is given to the various precautions to be observed to secure best results. Burned shellac is recommended as a binder for plaster-to-plaster bonding, while soap and kerosene are suggested for a parting compound. 2 figures. E.E.H.

Quaternary system CaO–Al_2O_3–$CaSO_4$–H_2O at 25°C. Equilibria with crystalline $Al_2O_3 \cdot 3H_2O$, alumina gel, and solid solutions. F. E. JONES. *Jour. Phys. Chem.*, **48,** 311–56 (1944).—In the first paper (*Ceram. Abs.*, **23** [8] 144 (1944)), the gel form of hydrated alumina was considered. This second paper deals with equilibria involving crystalline $Al_2O_3 \cdot 3H_2O$ and gives further data for the system with alumina gel in solutions of high lime concentrations and with solid solutions. The technique is the same as before. The formation of calcium sulfoaluminates in a hydrated Portland cement is discussed, and J. concludes that, in an alkali and iron-free cement, $3CaO \cdot Al_2O_3 \cdot 3CaSO_4 \cdot 32H_2O$ is initially formed but changes over partly or completely to the solid solution. The attack of $CaSO_4$ waters on concrete is mentioned briefly. 15 references, 12 figures. R.A.G.

Quinary system CaO–Al_2O_3–$CaSO_4$–K_2O–H_2O (1% KOH) at 25°C. F. E. JONES. *Jour. Phys. Chem.*, **48,** 356–78 (1944).—A further study of the reactions occurring in the setting and hardening of Portland cements and their disintegration on exposure to sulfate waters is described. Only the alumina gel phase equilibria have so far been studied; crystalline $Al_2O_3 \cdot 3H_2O$ will be dealt with later. The presence of alkali, resulting in reduced solubility of lime and increased solubility of alumina, causes considerable modifications in the solution compositions as compared with the quaternary system. Nevertheless, the compound $3CaO \cdot Al_2O_3 \cdot 3CaSO_4 \cdot 32H_2O$ is still the only quaternary stable solid phase. 15 references, 8 figures. R.A.G.

Quinary system CaO–$CaSO_4$–Al_2O_3–Na_2O–H_2O (1% NaOH) at 25°C. F. E. JONES. *Jour. Phys. Chem.*, **48,** 379–94 (1944).—The results confirm the behavior found in the corresponding K_2O system with some differences in the relative positions of the various boundary curves as a result of the substitution of sodium for potassium and the increase in the molecular concentration of the alkali. The application of the data to the conditions existing in a setting Portland cement is discussed. 5 references, 9 figures. R.A.G.

PATENTS

Cement composition and method of making. E. W. SCRIPTURE, JR. U. S. 2,383,891, Aug. 28, 1945 (July 17, 1942). 19 claims. Cl. 106-90.—1. In the process of grinding cement clinker, the step which comprises grinding the clinker in the presence of about 0.005 to about 0.1%, based on the weight of the cement, of 2-amino-2-methyl-1,3-propanediol.

Firing of cement or alkaline-earth carbonates, such as lime, etc. HANS GYGI. Swiss 221,247, Sept. 16, 1942 (Aug. 9, 1941); abstracted in *Chem. Zentr.*, **1943, I** [20] 2130.—The material is fired in a rotating electric-arc furnace without access of air or other gases so that heat is transmitted practically only by radiation. In this way not only is the formation of harmful N_2 compounds prevented, but also the escape of much heat from the furnace. M.HA.

Improvement of the mechanical properties of cement mortar and concrete, particularly compressive strength. LEOPOLD HEPPE. Fr. 876,383, Nov. 4, 1942 (Oct. 28, 1941); abstracted in *Chem. Zentr.*, **1943, I** [20] 2130.—A mixture of sulfite waste lye and a water-soluble aldehyde, especially furfurol, benzaldehyde, acetaldehyde, formaldehyde, or several of these materials, is added to the water for cement. If such mixture is to be used for Portland cement, Cl_2 gas can also be introduced. M.HA.

Enamel

Application of white cover coat direct to Ti-Namel steel. ANON. *Enamelist*, **22** [6] 6–9 (1945).—A recommended cleaning, pickling, and nickel-dip procedure is presented in detail. Fabrication and application problems are discussed briefly. V.D.F.

Are porcelain enamels threatened by new plastics? G. H. MCINTYRE. *Enamelist*, **22** [7] 9–10 (1945).—Popular misconceptions concerning the universal application of silicones as surface coatings are refuted. Silicones must be considered intermediate between present organic coatings and porcelain enamels but are much nearer organic coatings in all properties. V.D.F.

Business of comfort. C. S. PEARCE. *Enamelist*, **22** [3] 5–8, 58 (1944).—Plans for the increase of human comfort and convenience in the home are expected to offer new opportunities for the enameling industries. New trends in refrigeration, home laundries, and two-bathroom houses are discussed, and a number of needed developments are indicated, including more convenient dishwashing, food preparation and hot storage, waste disposal, odor removal, and atmosphere conditioning. V.D.F.

Chemical durability of porcelain enamels. RALPH L. COOK AND ANDREW I. ANDREWS. *Jour. Amer. Ceram. Soc.*, **28** [9] 229–56 (1945).—34 references, 27 figures.

Chemistry of surface cleaning. R. SANDERS. *Iron Age*, **155** [15] 62–67 (1945).—A discussion of the fundamental reactions involved in surface cleaning is given. Wetting action, emulsification, saponification, colloidal activity,

solvent power, buffer action, total alkalinity, and acidity are described and reviewed. 8 illustrations. E.E.H.

Five reasons for scumming. ANON. *Ceram. Ind.*, **45** [2] 60–61 (1945).—Possible causes of scumming on porcelain enameled surfaces are discussed. 7 illustrations. H.T.

History of porcelain enameling: V, Limoges enamels. ANON. *Enamelist*, **21** [12] 43–44 (1944). **VI, VII, Limoges enamelers.** *Ibid.*, **22** [1] 33–35 (1944); [5] 30–31 (1945); for Parts I to IV see *Ceram. Abs.*, **23** [11] 186 (1944). V.D.F.

Inland announces Ti-Namel steel. ANON. *Enamelist*, **22** [4] 22–23, 56 (1945).—A new titanium steel, developed by the Inland Steel Co., makes possible the direct application of white or pastel enamels. It has unusual resistance to sag, excellent drawing qualities, and does not age-strain. V.D.F.

Inoculants in gray iron. REBECCA HALL SMITH. *Iron Age*, **155** [11] 58–62 (1945).—S. discusses theory, types, and methods of adding inoculants to gray iron. Chill tests and types of graphite structures are illustrated. The resulting improvement by these additions is due to graphite-particle control or stabilizing and strengthening effect on the matrix. 5 references, 8 figures. E.E.H.

New controls for enamel furnaces. ANON. *Ceram. Ind.*, **45** [2] 56–59 (1945).—Present enamel furnaces lack sufficient controls. Possible improvements with regard to temperature, atmospheric, time, and moisture controls are discussed. 10 illustrations. H.T.

Opacification in enamels. H. GROTH. *Emailwaren-Ind.*, **20**, 67–69 (1943); abstracted in *Chem. Zentr.*, **1943, II** [17] 1573.—Gaseous opacifiers give an opacification of 80% white content for an addition of 4% in present-day boron-free enamels. M.HA.

Porcelain enamel colors. A. I. ANDREWS. Presented at meeting of Chicago District Enamelers' Club, May, 1945; abstracted in *Ceram. Ind.*, **45** [1] 66 (1945). H.T.

Porcelain enamel in future markets. C. L. VAN DERAU. Presented at meeting of Chicago District Enamelers' Club, May, 1945; abstracted in *Ceram. Ind.*, **45** [1] 66 (1945). H.T.

Porcelain enamel promotes efficient heat transfer. E. E. BRYANT. *Enamelist*, **22** [1] 8–11, 56 (1944).—The faster heat transfer by radiation and air conduction through an enameled-iron heat-exchanger wall as compared with metal-plated iron or iron alone is discussed theoretically. The application of this characteristic of enamel in the design of heat exchangers of all kinds operating up to 1000°F. is urged. V.D.F.

Porcelain enameling furnace recuperator. E. W. DANY. *Enamelist*, **22** [8] 14 (1945).—Details of construction and the conditions of operation of the Fitch recuperator are presented. Fuel savings with natural gas at 51¢ per M amounted to 50¢ per hour in one installation, permitting amortization in 17 months. V.D.F.

Porcelain enameling—then and now. A. H. HAESSLER. *Enamelist*, **22** [7] 13–15, 54 (1945).—H. recalls enameling plant practice of twenty-five years ago, contrasting it at each point with modern techniques. V.D.F.

Refresher course for porcelain enamelers: IX, Firing and inspection. Edited by J. E. HANSEN. *Enamelist*, **21** [12] 14–21 (1944). **X, Shop troubles.** *Ibid.*, **22** [1] 22–27, 63–64 (1944). **XI, Process control.** *Ibid.*, [2] 22–27, 39–53. **XII, Enamel shop construction, equipment, and layout.** *Ibid.*, [3] 10–15, 36–40; see *Ceram. Abs.*, **24** [3] 52 (1945). V.D.F.

Research and the vitreous enameling industry. G. H. ABBOTT. Presented at meeting of Institute of Vitreous Enamellers, Manchester, England, Nov. 24–25, 1944. Advance copy, 11 pp.

Safety precautions in cleaning organic solvent tanks. ANON. *Stove Builder*, **9** [11] 28–29 (1944).—The method of cleaning organic solvent tanks is described. Steam and high pressure water hose are particularly useful in removing sludge from certain installations. The proper clothing, use of respirators, and installation of safety equipment are recommended. E.E.H.

Standardization of quality control in porcelain enameling. R. F. BISBEE. *Enamelist*, **22** [4] 9–21, 52 (1945).—The control procedure for materials, fabrication, and processes is outlined as developed by the Westinghouse Electric & Mfg. Co., and the inspection methods are presented in detail. Instruction charts and standard samples illustrating the maximum passable defects of each type were found to improve inspection efficiency and uniformity. Photoelectric color-matching attempts were unsuccessful, and visual matching in a "tunnel of light" was developed, using a light intensity of 190 to 200 foot-candles provided by a combination of incandescent and mercury-vapor lamps installed to give indirect illumination from the egg-shell-white tunnel walls. A set of four standard color panels allows classification of ware according to a color number, which is then stamped on the piece; a unit is assembled from pieces having the same color number. Color-matching personnel are given tests to determine their threshold of vision before and after exposure to strong light; Vitamin A therapy has been found valuable in improving their performance and in reducing eye strain. The crating procedure for electric ranges was revised by using a "floating" packing which permitted a reduction in cost by eliminating the need for extra gussets and braces in range design. The Incline-Impact Conbur test, which reveals defective product design or packing from the standpoint of shipping vibration and shock, is reviewed. 9 illustrations. See "Review . . .," *Ceram. Abs.*, **24** [3] 52 (1945). V.D.F.

What is the porcelain enameling industry doing about chippage? E. E. BRYANT. *Enamelist*, **22** [7] 4–9 (1945).—Existing standard tests for chippage are evaluated in terms of service conditions. A modification of the Porcelain Enamel Institute torsion test is suggested to permit the use of samples of various thicknesses by reference to a correction chart. A new chippage test for flat samples involves flexure under measured load until chippage occurs, the sample dimensions, preparation, etc., being closely specified. Analysis of chippage failures in practice indicates that a combination of strain and shock should be employed in testing. V.D.F.

Who will operate the postwar porcelain enameling plant? C. D. CLAWSON. *Enamelist*, **22** [8] 6–9, 54–55 (1945).—Data are presented to illustrate that the ceramic industry too is approaching "technical bankruptcy" between 1950 and 1955, as a result of the policy of the U. S., alone of all nations, of sacrificing scientific education during the war. C. urges that the ceramic industry establish incentives to increase enrollment in the ceramic colleges. V.D.F.

PATENTS

Manufacture of white opacified enamels. DEUTSCHE GOLD- UND SILBER-SCHEIDEANSTALT VORM. ROESSLER. Ital. 386,301, Sept. 16, 1940; abstracted in *Chem. Zentr.* **1943, I** [25] 2626; addition to Ital. 374,044; *ibid.*, **1940, II**, 3758.—When using nongaseous organic compounds as opacifiers, e.g., vinylic or acrylic compounds, according to Ital. 374,044, batches are made up that are free of B compounds or contain less than 5% $B(OH)_3$. The opacifier can be natural or synthetic caoutchouc. M.HA.

Method for the simultaneous development of several colors in enamels and glazes in a single firing. I. G. FARBENINDUSTRIE AKT.-GES. (Robert Weinig, inventor). Ger. 732,614, March 6, 1943 (Dec. 9, 1939); cl. 48*c*; abstracted in *Chem. Zentr.*, **1943, I** [23] 2435.—Using an enamel free of or low in B and containing a Cd color, the applied enamel layer is treated only in places with sulfur, substances giving off sulfur, sulfides, B compounds, or mixtures of these materials and fired in the normal manner. M.HA.

Glass

British optical glass. M. SCHOFIELD. *Discovery*, June, 1945; abstracted in *Optician*, **109** [2834] 430 (1945). A.P.

Canada's optical industry. H. C. BATES. *Jour. Can. Ceram. Soc.*, **14**, 56–59 (1945).—B. describes the precision type of optical glass and instruments produced by Research Enterprises, Ltd. G.A.K.

Cancellation of nonvital production schedules Anchor Hocking policy for last four years. ANON. *Amer. Glass Rev.*, **64** [41] 24, 26, 46 (1945).—Wartime production schedules for Anchor Hocking Glass Corp. glass containers, ovenglass, tableware, and industrial glassware have been met by simplification and standardization. Capacity postwar operations are foreseen. A.P.

Corning "killer" glass helps save lives. ANON. *Amer. Glass Rev.*, **64** [36] 9 (1945).—Corning Glass Works' 9741 glass is said to be the only glass which can be melted and worked by conventional methods and yet transmits sufficient germ-killing ultraviolet rays. It is used in germicidal lamps in place of fused silica. An indirect product of thousands of glass formulas developed at Corning, the direct inventor was Harrison Hood. The tubing is made in an updraw machine at the Fall Brook plant for close control of thickness to 0.025 in. Transmission of ultraviolet is also checked regularly. Vycor brand glass is also being used in some germicidal lamps. A.P.

Designed for the best use of glass blocks in postwar homes. J. E. MCNAMARA. *Amer. Builder*, **67** [8] 82–85 (1945).—Two houses designed by architects for the utilization of glass blocks are described. The architects were retained by glass-block manufacturers, and the houses were planned from the ground up for the best use of the product. No plans of the houses are for sale. 8 figures. M.R.

Determination of the grinding hardness of glass. HANS SCHULZ. *Glastech. Ber.*, **20**, 323–24 (1942); abstracted in *Chem. Zentr.*, **1943, I**, 2023.—S. discusses the defects of the various testing methods. The grinding process is considered to have three partly overlapping stages. Under low pressure (1) the simple scratch action is predominant, which can be assumed as linear to pressure increase. Increasing pressure leads to destruction of the structure by cracks (2) observable with rolling grinding grains and static pressure. With still higher pressure (3) cutting edges spall off and the grinding grains are crushed. When grinding agent and water are continually introduced, the reduction of material under constant pressure is proportional to the time (as 1). M.HA.

Experiences with substitute raw materials. V. ČTYROKÝ. *Glashütte*, **72**, 241–45 (1942); abstracted in *Chem. Zentr.*, **1943, I** [23] 2434.—Considerable amounts of alkali can be saved in many glasses by substituting phonolite, granite, basalt, feldspar, or lepidolite. Red lead oxide cannot entirely be replaced by BaO; a particularly favorable ratio is 15% BaO to 4–6% PbO. Good substitutes for B_2O_3 are combinations of MgO, CaO, ZnO, and BaO. Arsenic for clarification can be replaced advantageously by sodium antimonate in almost the same amounts by weight. See "By . . .," *Ceram. Abs.*, **21** [7] 140 (1942). M.HA.

Fiberglas. WILLIAM H. PAGE. *Compressed Air Mag.*, **50** [8] 200–205 (1945); *Amer. Glass Rev.*, **64** [41] 25, 32, 46 (1945).—The history, properties, and uses of Fiberglas are discussed, with emphasis on wartime developments. In 1942 the U. S. Navy used more than 22 million sq. ft. of Fiberglas insulating boards; in 1943 almost twice as much as in 1942; and in 1944, 3 times as much. There is approximately 360,000 sq. ft. of Fiberglas insulation on an aircraft carrier plus 326,000 ft. of Fiberglas tapes and wrappings. Fiberglas fabrics coated with synthetic rubbers or resins are used as collapsible containers. 9 illustrations. M.B. & A.P.

Fiberglas lining used for heat, sound insulation in AAF super aircraft. ANON. *Amer. Glass Rev.*, **64** [40] 9 (1945).—The Boeing C-97 military version of the Stratocruiser is equipped with a 0.5-in. lining of glass fibers. The lining is 225 lb. lighter and has 6.3% less thermal conductivity than alternative materials. A.P.

Fiberglas in research. R. RICHARDSON. *Jour. Can. Ceram. Soc.*, **14**, 30–36 (1945).—R. describes some new uses for Fiberglas. Glass-reinforced low-pressure plastics are being used in the fabrication of aircraft parts. Many new uses have been found for glass in the development of silicones. Silicone insulating varnish used on motor windings gives motors increased power and permits their use at higher temperatures than could formerly be used. Glass fibers are being used in sound insulation, as wicks for oil burners, and in humidifiers, and experiments are being carried out on glass fibers as reinforcing cords in automobile tires. Several uses for glass fibers in medical research are described. G.A.K.

Glass battery separators. ANON. *New Equipment Digest*, **10** [8] 13 (1945).—Glass separators used in place of rubber permit the charging of batteries prior to shipment. They are made by the Glassfloss Mfg. Co., 155 E. 44th St., New York, N. Y. F.C.A.

Glass-ceramic-metal transitions. G. MÖNCH. *Glas u. App.*, **24** [2] 11–15 (1943); abstracted in *Chem. Zentr.*, **1943, I** [23] 2434.—The various methods for making joints between quartz glass and ceramic materials with metals by grinding, soldering, and melting are described in detail. M.HA.

Houghtons of Corning. ANON. *Fortune*, **32** [1] 128–33, 253–54, 256, 258, 260 (1945); reprinted in *Amer. Glass Rev.*, **64** [40] 7, 10–11, 19–21; [41] 8, 19–21 (1945). A.P.

How to build glass sections of model homes. ANON. *Amer. Builder*, **67** [8] 86–87 (1945).—Construction details are given on the use of standard materials to provide the most efficient performance in present-day building. 16 diagrams. M.R.

More data on cooling may lead to redesigned glass tanks. ANON. *Ceram. Ind.*, **45** [2] 51–54 (1945).—A scientific investigation of the effect of cooling on glass-tank life is suggested to arrive at improved tank designs and more economical production. 7 illustrations. H.T.

Mosaic glasses. V. ČTYROKÝ. *Sklářské Rozhledy*, **19**, 143–52 (1942); abstracted in *Chem. Zentr.*, **1943, I** [17] 1809.—The history and the manufacture of mosaic glasses, their chemical composition, and atmospheric influences are discussed with tables of analyses and photomicrographs of different glass samples. Practical tests determined that German glasses contain 12 to 20%, Bohemian glasses about 16%, and Italian glasses 20% alkali. Lixiviation and decaying tests under atmospheric conditions gave indications useful for the production of resistant melts. M.HA.

New silica block for Radiamatics. ANON. *Bull. Amer. Ceram. Soc.*, **24** [9] 354 (1945).—A new silica block for the measurement of crown temperatures in glass tanks has been developed for use with Radiamatics, radiation pyrometers made by the Brown Instrument Co., Philadelphia, Pa.

Newsmen shown precision plate glass products of L-O-F. ANON. *Amer. Glass Rev.*, **64** [38] 19 (1945).—Hundreds of precision plate-glass products used in war instruments were shown to newspapermen on a tour of the Libbey-Owens-Ford Toledo and Rossford plants. Bomber noses; prismatic vision blocks; periscopes for tanks, submarines, and amphibious jeeps and landing craft; optical glass for gunsights and mirrors; and window and cabin assemblies for airplanes were exhibited. Thick precision plate has been found to be of such quality that it could be used for heavy prisms. Two million prisms have been produced so far. A.P.

Offhand glassworking course. ANON. *Amer. Glass Rev.*, **64** [41] 11 (1945).—Seven students have completed the first vocational educational course in offhand glassworking at Corning Free Academy. A tank furnace with a capacity of 50 lb. was built, and students were taught the arts of gathering and blowing glass. A.P.

Operators want more combustion space in glass tanks. ANON. *Ceram. Ind.*, **45** [2] 48–49 (1945).—Comments of glass operators in reply to a questionnaire on the subject of combustion space and glass-tank dimensions are presented. 4 illustrations. H.T.

Optical glass production. ANON. *Ceram. Ind.*, **45** [1] 52–54 (1945).—The plant of the Hayward Optical Glass Co., Maywood, Calif., makers of precision glass, is described. 6 illustrations. H.T.

Owens-Illinois prepares for peace while producing for war. ANON. *Amer. Glass Rev.*, **64** [41] 31, 40, 43 (1945). —Ten thousand separate items for war and civilian life are packaged in glass containers. For insect repellants alone, 127,144,000 2-oz. bottles were produced in 1943 and 1944 by two Owens-Illinois plants. An average working force of 18,000 was maintained in 1944 by a training program. Each of the 6000 workers in service will be offered his former job or a better one and training for advancement. Research and development facilities have been expanded. New plants are to be built at Atlanta, Ga., and Longview, Wash. A.P.

Physical properties of glass: II, Density of silicate glasses. J. M. STEVELS. *Rec. trav. chim.*, **62**, 17–27 (1943); abstracted in *Chem. Zentr.*, **1943, I** [23] 2380.—A new formula is derived for the calculation of the volume, *V*, of a glass block which contains 1 gm. atom of O ions. Over a large range, *V* is independent of the number and nature of the metal ions existing in the glass. The validity of the formula was proved on a number of glasses. For Part I see *Ceram. Abs.*, **21** [7] 141 (1942); see also "New . . .," *ibid.*, **23** [6] 103 (1944). M.HA.

Pittsburgh Plate developments proved to aviation engineers amazing characteristics of glass. ANON. *Amer. Glass Rev.*, **64** [42] 7, 15 (1945).—An exhibit of Pittsburgh Plate Glass Co. contributions to aviation glass included (1) a pilot's window with a door at one end to allow vision when the windshield was obscured, (2) "flexible" Flexseal glass, (3) Multiplate bulletproof glass, (4) double-glazed windows with warm air between, (5) glass for pressurized cabins with the features of high strength and a plastic laminate to retain pressure if the glass breaks, (6) lai. inated plastic gun blisters, and (7) Radomes made of Fiberglas impregnated with Pittsburgh's resin CR-39. Bent safety glass or Radomes may be adapted for automobile tops. A.P.

Pittsburgh Plate increases products, improves processes to meet needs of war. ANON. *Amer. Glass Rev.*, **64** [41] 28–30, 41 (1945).—Specialized types of airplane glass produced by the Pittsburgh Plate Glass Co. in 1944 included 31 pieces of nine different types of glass for the Superfortress, the bullet-resisting gunsight reflector glass used in the windshield of the Black Widow, an ultraflat camera window glass (*Ceram. Abs.*, **24** [5] 88 (1945)), and the glazing for the RP-63 target plane. Glass tanks and Foamglas insulation have helped industrial production, and methods and processes for making glass products have been improved. Increase in glass research and production during the war will lead to improved structural glass products for stores and homes. A.P.

Pittsburgh Plate makes calibrated dial for sounding instrument. ANON. *Amer. Glass Rev.*, **64** [39] 8 (1945). —A dial and a cover plate in one piece for the Fathometer are being made at the Ford City works 4 of the Pittsburgh Plate Glass Co. out of tempered polished plate glass $^3/_{16}$ to $^1/_4$ in. thick and 11 ± 0.005 in. in diameter. The front face is treated for reflection reduction, and ceramic enamel markings are fused into the glass with the aid of metal-screen stencils. Cover photograph. A.P.

Purification of silica sand. E. O. LILGE. *Can. Chem. Process Inds.*, **29** [7] 480–82 (1945).—Specifications for good glass sand are summarized. Tabling and magnetic separation of certain Alberta tar sands make them suitable for container glass. Economic factors limit the market for these deposits. B.L.

Secondary electron emission of Pyrex glass. C. W. MUELLER. *Jour. Applied Phys.*, **16** [8] 453–58 (1945).—Total secondary emission of Pyrex brand glass was measured by utilizing the conductivity of the heated glass to carry the current. Yield values over the entire curve from 50 to 10,000 volts were measured. A sharp maximum at 400 volts contrasts with the broad maximum usually found in metals. No temperature variation of secondary emission was observed, but changes in behavior as a consequence of previous bombardment were evident. A.P.

Sintered glassware: I, II. I. C. P. SMITH. *Ind. Chemist*, **19** [221] 317–21; [222] 393–98 (1943); see *Ceram. Abs.*, **24** [5] 88 (1945). D.G.P.

Steel to glass seal. ANON. *New Equipment Digest*, **10** [8] 9 (1945).—Glass and steel airtight joints are made by fusion in a method developed by the Radio Corp. of America, Camden, N. J. F.C.A.

Twice the structural glass of prewar building use seen in period ahead. ANON. *Amer. Glass Rev.*, **64** [42] 18 (1945).—New industrial, commercial, and residential buildings will use twice as much glass as was used in prewar buildings because of the development of solar houses, double-glazed units, all-glass store fronts, Foamglas, Fiberglas sound-absorbing boards, and glass blocks. A.P.

Utilization of liquid petroleum gases replacing manufactured gas. E. G. BOYER. *Amer. Gas Jour.*, **163** [2] 11–16 (1945).—B. discusses the problem of meeting the increased demand for manufactured gas by the use of liquid petroleum gases. The following methods of utilizing liquid petroleum gases are given: (1) complete replacement of the original gas; when using this method, a much higher B.t.u. gas must be distributed to operate satisfactorily in appliances; (2) distribution of the liquid petroleum-air mixture at the same B.t.u. as the original gas; and (3) pressure increases in the distribution system. Difficulty is experienced in interchanging directly coke-oven gas and carbureted water gas. Because of its higher specific gravity, the carbureted water gas flows more slowly from the burner than does coke-oven gas, resulting in a shorter flame. G.A.K.

PATENTS

Apparatus for the continuous production of corrugated glass sheets. LOUIS BOUDIN (vested in the Alien Property Custodian). U. S. 2,382,379, Aug. 14, 1945 (May 4, 1940; in France May 23, 1939). 4 claims. Cl. 49-33.

Apparatus for melting glass. GAMES SLAYTER (Owens-Corning Fiberglas Corp.). U. S. 2,383,168, Aug. 21, 1945 (May 23, 1944). 6 claims. Cl. 13-6.

Apparatus for refining glass. G. D. CAMPBELL (Pittsburgh Plate Glass Co.). U. S. 2,384,073, Sept. 4, 1945 (June 5, 1942). 8 claims. Cl. 49-54.—1. In a glass-melting tank for containing a molten glass bath normally flowing through the tank at predetermined level, a skim kiln extending outwardly from one side of the tank in communication therewith, refractory means extending transversely of the skim kiln beneath the molten-glass level therein and spaced from the bottom of the tank to receive portions of the molten bath flowing into the kiln above the refractory means and out of the kiln below the refractory means.

Apparatus for treating glass. ALFRED VANG (one half to Stevenson, Jordan & Harrison, Inc.). U. S. 2,382,187, Aug. 14, 1945 (Aug. 25, 1942). 4 claims. Cl. 49-39.—1. An apparatus for treating glass comprising a plate for supporting molten glass, means for applying supersonic vibrations to a bottom point of the plate, and means for pouring a stream of molten glass upon the plate at a point directly above the bottom point.

Cleaning and coating glass, plastics, and other surfaces. W. H. COLBERT AND A. R. WEINRICH (Libbey-Owens-Ford Glass Co.). U. S. 2,383,469, Aug. 28, 1945 (Dec. 15, 1943). 6 claims. Cl. 117-54.

Container blowing and cooling apparatus. O. H. SAMUELSON AND A. T. ZAPPIA (S. & Z. Mfg. Co., Inc.). U. S. 2,382,028, Aug. 14, 1945 (Oct. 1, 1942). 8 claims. Cl. 49-19.

Decorating machine. PAGE WENSEL, H. L. WHISNER, AND R. H. RUGH (Owens-Illinois Glass Co.). U. S. 2,383,947, Sept. 4, 1945 (April 28, 1943). 13 claims. Cl. 101-123.

Double-walled glazing units and method of manufacture. R. HADDAN (Corning Glass Works). Brit. 570,747, Aug. 1, 1945 (May 24, 1943).

Electric insulator. J. J. TOROK (Corning Glass Works). U. S. 2,383,090, Aug. 21, 1945 (Sept. 25, 1941). 3 claims. Cl. 174-196.

Glass composition. A. G. PINCUS (American Optical Co.). U. S. 2,381,925, Aug. 14, 1945 (Nov. 24, 1941). 15 claims. Cl. 106-47.—1. A glass composition whose chemical analysis may be expressed as follows (in parts by weight): P_2O_5 60 to 35, Al_2O_3 10 to 20, and ZnO 1 to 80.

Glass-to-metal seals. DARWINS, LTD., A. LINLEY, AND C. E. ADAMS. Brit. 570,539, July 25, 1945 (Oct. 11, 1943).

Glass transparent to far ultraviolet. H. P. HOOD (Corning Glass Works). U. S. 2,382,056, Aug. 14, 1945 (April 21, 1944). 6 claims. Cl. 106-54.—1. An ultraviolet-transmitting glass which comprises essentially silica, boric oxide, alumina, and alkali-metal oxide, the silica being 50 to 65%, the alumina 4 to 10%, and the alkali-metal oxide 3 to 5%, the molecular ratio of boric oxide to alkali-metal oxide being greater than 2 to 1, the percentage of alumina being not less than the percentage of alkali-metal oxide, and the glass being substantially free from coloring oxides and oxides of zinc and antimony and having a transmission of at least 1% for wave length 185 $m\mu$ in 1 mm. thickness.

Glassware-working apparatus. E. E. SLICK. U. S. 2,383,349, Aug. 21, 1945 (May 27, 1940); continuation of application Serial No. 64,227, Feb. 17, 1936. 9 claims. Cl. 49-5.

Glassworking machine. D. E. GRAY (Corning Glass Works). U. S. 2,382,052, Aug. 14, 1945 (Oct. 4, 1939). 5 claims. Cl. 49-5.

Heat-transmitting glass. CHANCE BROS., LTD., AND J. G. HOLMES. Brit. 570,946, Aug. 9, 1945 (March 21, 1944).

Incandescent lamp or discharge tube. N. V. PHILIPS' GLOEILAMPENFABRIEKEN. Belg. 449,143, Nov. 2, 1943 (Feb. 10, 1943); abstracted in *Chem. Zentr.*, **1944, II** [3/4] 148.—The glass into which the metal leads are fused has an SiO_2 base, and the PbO is replaced in part by 5 to 20% alkali oxides. It also contains 1 to 10% ZnO and eventually Al_2O_3, CaO, and MnO. In Pb-free glasses with a high Ba content, at least two thirds of the alkali oxide content should consist of K_2O. M.HA.

Increase of the colorability of glass fibrous material for organic colors which are used in an aqueous medium. DEUTSCHE GLASTECHNISCHE GES. E. V. (Hans Freytag, inventor). Ger. 737,618, July 20, 1943 (March 20, 1941); cl. 8*m*; abstracted in *Chem. Zentr.*, **1943, II** [17] 1573–74.—The glass fiber, moistened with water, is treated with aqueous hydrofluoric acid or aqueous solutions of alkali fluorides and acids which liberate HF from the alkali fluorides; without rinsing, alkali hydroxide solutions are made to act on the etched fiber, which is then rinsed and dried. To the alkali hydroxide solutions, hydroxides of Cu, Zn, Cd, Sn, Co, or Ni or salts of these metals can be added, which form hydroxides in the alkali hydroxide solutions. HF solutions containing inorganic or organic acids or their water-soluble salts can also be used. The glass fiber can be colored immediately after the rinsing following the lye treatment. M.HA.

Increase of colorability of glass fibrous material with basic coloring agents according to Ger. 737,618. DEUTSCHE GLASTECHNISCHE GES. E. V. (Hans Freytag, inventor). Ger. 738,145, Aug. 4, 1943 (July 1, 1941); cl. 8*m*; abstracted in *Chem. Zentr.*, **1943, II** [17] 1574.—The HF-etched fiber is further treated to fix the coloring materials. M.HA.

Joining of glass with metal. B. LONG. Belg. 440,847, July 13, 1942 (March 12, 1941); abstracted in *Chem. Zentr.*, **1943, I** [23] 2435.—The joint is made by using an elastic intermediary material which will combine with both glass and metal. Such materials are metals oxidized on the surface (Al or Cu). M.HA.

Manufacture of mineral wool. M. E. CALLANDER. U. S. 2,382,290, Aug. 14, 1945 (Nov. 22, 1940). 4 claims. Cl. 49-77.5.

Manufacture of pressed glass sockets for electron tubes. C. LORENZ A.-G. Dan. 60,600, Feb. 15, 1943 (Jan. 28, 1941); abstracted in *Chem. Zentr.*, **1943, II** [13] 1217.—The lead-in wires are fused into the tube socket under simultaneous pressing, while the socket is rotated about a horizontal axis. The fused joint is reliable and does not require too hot a flame for fusion. M.HA.

Manufacture of signal bells of glass. VEREINIGTE LAUSITZER GLASWERKE A.-G. (Wolfram Hirsch, inventor). Ger. 730,382, Jan. 11, 1942 (June 23, 1939); cl. 74*a*; abstracted in *Chem. Zentr.*, **1943, I** [22] 2332.—The glass used contains PbO, and the pitch of the bells is changed by changing the PbO content, e.g., glass mixtures with 6, 16, 24, or 30% PbO are made. M.HA.

Manufacture of thin films of glass. PATENTVERWERTUNGS-GES. M. B. H. "HERMES." Fr. 886,301, Oct. 12, 1943 (Oct. 1, 1942); abstracted in *Chem. Zentr.*, **1944, II** [3/4] 152.—The glass is blown in an oxygen-free atmosphere with the addition of substances which reduce the viscosity and surface tension of the glass. These substances are added before or during blowing and consist of N_2, CO, CO_2, SO_2, H_2, NH_3, water vapor, or gaseous, liquid, or powdered hydrocarbons of the paraffin series. The latter are added to the molten glass mass. M.HA.

Marking glass objects. ALLGEMEINE ELEKTRICITÄTS-GES. (Paul Galezki, inventor). Ger. 731,088, Feb. 1, 1943 (April 5, 1941); abstracted in *Chem. Zentr.*, **1943, I** [22] 2332.—Marks are made by burned-in pastes or solutions that contain phosphoric acid to which opacifying or coloring substances can also be added. The marks are dusted with metal powder before burning in. Because of the hygroscopic properties of H_3PO_4, the paste remains wet on the glass plate and needs be made up only once daily. M.HA.

Method and apparatus for cleaning and surface-coating glass, etc. W. L. MORGAN (Libbey-Owens-Ford Glass Co.). U. S. 2,383,470, Aug. 28, 1945 (Aug. 14, 1944). 10 claims. Cl. 117-6.

Method and apparatus for grinding lenses. A. G. POWELL. U. S. 2,383,501, Aug. 28, 1945 (March 20, 1944). 1 claim. Cl. 51-124.

Process of manufacture of safety glass. J. H. BOICEY AND I. A. WILLEY (Libbey-Owens-Ford Glass Co.). U. S. 2,382,956, Aug. 21, 1945 (Oct. 21, 1942). 4 claims. Cl. 154-2.71.

Reflection-reducing surfaces on glass. RADIO CORP. OF AMERICA. Brit. 570,717, Aug. 1, 1945 (May 28, 1943).

Sealing closure members to glass envelopes. GENERAL ELECTRIC CO., LTD., R. L. BREADNER, AND C. H. SIMMS. Brit. 570,920, Aug. 9, 1945 (March 15, 1944).

Selenium ruby glass. C. R. AUSTIN AND J. D. SULLIVAN (Battelle Memorial Institute). U. S. 2,382,282, Aug. 14, 1945 (Nov. 5, 1942). 4 claims. Cl. 106-52.—1. A selenium ruby glass containing 69 to 74% SiO_2, 13 to 16% $Na_2O + K_2O$, 7 to 13% $CaO + MgO$, 1 to 4% Al_2O_3, less than 1% of ZnO, at least 0.03% selenium, cadmium in effective amounts up to 0.78%, and sulfur in effective amounts up to 0.22%.

Weight and capacity testing device. G. P. NAIRN (Anchor Hocking Glass Corp.). U. S. 2,383,269, Aug. 21, 1945 (Jan. 29, 1943). 12 claims. Cl. 73-149.

Structural Clay Products

Improvements in drainpipe making machinery. T. CARTER. *Claycraft*, **18** [8] 319–20 (1945).—Strain and labor can be eliminated and production increased by discarding hand-lever methods and substituting electrical control and operation in sewer-pipe machines. G.A.K.

New method of adding barium carbonate to salt-containing clays. F. SINGER. *Schweiz. Tonwaren-Ind.*, **47** [2] 5–6 (1944); abstracted in *Chem. Zentr.*, **1944, II** [3/4] 151.—For uniform addition of barium carbonate, S. suggests that an aqueous suspension be made and stabilized by bentonite. M.HA.

Planned approach to the postwar building market. R. H. COCHRAN. *Jour. Can. Ceram. Soc.*, **14,** 47–51 (1945).—The Ohio Brick and Tile Institute has a plan to make builders and prospective users face-brick conscious. The advertising and promotional campaign includes advocating the brick veneering of old structures of all kinds, the sale of plans and blueprints of homes for a nominal sum, the distribution of various advertising pamphlets and manuals, and the sponsoring of exhibitions. G.A.K.

Refractories

Applications of boiler refractories. G. P. REINTJES. *Power*, **87** [6] 95 (1943); abstracted in *Eng. & Boiler House Rev.*, **57,** 314 (Nov., 1943); *Woodall-Duckham Co. Tech. Press Rev.*, No. 925, p. 7 (Nov. 3 and 10, 1943).—Metal is saved and appearance improved by an air-cooled furnace floor which eliminates the use of metal ducts connecting walls, fans, and burners. The floor is an all-refractory arch. Special interchangeable tile is used for the setting of burner rings, and all-refractory self-cooling nozzles are employed.

Behavior of chrome ores and chrome-magnesite brick in reducing atmospheres. T. R. LYNAM, T. W. HOWIE, AND J. H. CHESTERS. *Bull. Brit. Refrac. Research Assn.*, No. 56 (1940); reprinted in *Trans. Brit. Ceram. Soc.*, **44** [5] 63–67 (1945).—Up to the stage of the investigation covered, it appears that the following conclusions are justified: (1) Certain chrome ores show an abnormal expansion when heated in a reducing atmosphere. (2) Ores from certain districts are particularly prone to this effect. (3) Ores from certain other districts do not show this effect when heated alone but may do so after prolonged heating in contact with magnesia or after use in contact with iron oxide. (4) Such abnormal expansion taking place in a kiln may lead not only to outsize brick but to crumbliness and high porosity. (5) The mechanism of the effect is not certain, but it may well be due to the action of the reducing gases, on free iron oxide resulting in carbon deposition. (6) The ores which show the effect worst are generally high in iron oxide and opaque in thin section. R.A.H.

Combination process for alumina. JUNIUS D. EDWARDS. *Amer. Inst. Mining Met. Engrs. Tech. Pub.*, No. 1833; *Metals Tech.*, **12** [3] 5 pp. (1945).—There is only a little high-grade bauxite in this country, but there is substantially more low-grade bauxite which has more alumina than clays. The Bayer process can be used, but too much soda and alumina are lost in the red mud. A lime-soda process has been worked out, but it does not give pure enough alumina. A new combination process has now been developed which starts with the red-mud residue of the Bayer process. See "More . . .," *Ceram. Abs.*, **24** [7] 125 (1945). W.D.F.

Durability of refractories. W. J. REES. Address to the Midland Metallurgical Societies; abstracted in *Iron & Coal Trades Rev.*, **147,** 756 (Nov. 12, 1943); *Woodall-Duckham Co. Tech. Press Rev.*, No. 926, p. 7 (Nov. 17 and 24, 1943).—R. reviews the development in the quality of refractories during the last 20 years. Much progress has been made in producing brick under pressure without the presence of fluxing impurities. Research has provided reliable data with regard to the aftershrinkage of brick. Considerable improvement has been achieved in jointing cements.

Electric furnace capacity. JOHN MCBROOM. *Foundry*, **73** [4] 115, 235–36 (1945).—A method is described for determining the size of furnace shell for any size heat. Refractory considerations are discussed. 3 figures. F.G.H.

Get the jump on furnace failures with early repairs. S. M. ELONKA. *Power*, **88** [7] 467–69 (1944).—Practical pointers are given for refractory repairs in boiler furnaces. 8 figures. F.G.H.

Ladle practice for the steel foundry. EARL VANCE. *Foundry*, **71** [10] 185–88 (1943).—V. discusses the properties, selection, and application of ladle brick, stopper heads, sleeves, and nozzles. He describes various methods of installation for brick-lined ladles. F.G.H.

Ladle wells. W. C. KITTO AND W. F. NICODEN. *Proc. Natl. Open Hearth Conf., Amer. Inst. Mining Met. Engrs.*, **25,** 85–86 (1942).—A nozzle cap brick or burned insert well is used. The top of the nozzle fits neatly into the cap brick, and the well, in the shape of a shallow saucer, prevents the formation of skull. A special extension in the ladle holds the end of the nozzle, which saves extra layers of brick in the bottom of the ladle. A sand damper is also used, which prevents dribbles of the metal. W.D.F.

Manufacture of gasworks refractories. Important industry at Bacchus Marsh (Vic.). D. B. DOYLE. *Nat. Gas Bull. Australia*, **7,** 19–21 (Jan.-Feb., 1943); abstracted in *Woodall-Duckham Co. Tech. Press Rev.*, No. 909, p. 5 (June 16, 1943).—An illustrated description is given of the Bacchus Marsh Works of the Darley Firebrick Co. Pty., Ltd., and of the refractories manufactured there.

Melting 80% ferromanganese in cupolas. JOHN HOWE HALL. *Foundry*, **73** [5] 107, 195–96, 198 (1945). F.G.H.

Open hearth in 1943. FRANK G. NORRIS. *Blast Furnace Steel Plant*, **32** [1] 73–77 (1944).—Developments include the measurement of temperature by radiation equipment in the hot ends of all four checker chambers. Several technical papers are reviewed. B.L.

Pouring-pit refractories manufactured by the extrusion process. GEORGE E. MERCER. *Blast Furnace Steel Plant*, **30** [12] 1408–11 (1942).—The manufacture is described. B.L.

Properties of refractories. J. A. KAYSER. *Foundry*, **73** [4] 113–114, 224, 226, 228 (1945).—K. presents a review of the fundamental properties of all types of refractories. F.G.H.

Repairing bottom after tapping. J. L. NICHOLS ET AL. *Proc. Natl. Open Hearth Conf., Amer. Inst. Mining Met. Engrs.*, **25,** 260–64 (1942).—For acid furnaces, repair sand should be thoroughly sintered. One man puts in a new bottom in 48 hr., but others say that if done that fast it will come up. Oil is faster than gas for burning in the bottom. Some trials have been made with rammed bottoms, using a sand and molasses mixture. Men work at ramming at 200°F. Caves in banks and bottoms can sometimes be found by a little spout of slag. W.D.F.

Reversible thermal expansion and other properties of some calcium ferrous silicates. G. R. RIGBY, G. H. B. LOVELL, AND A. T. GREEN. *Bull. Brit. Refrac. Research Assn.*, No. 65 (June, 1943); reprinted in *Trans. Brit. Ceram. Soc.*, **44** [3] 37–52 (1945).—The preparation of a number of compositions in the CaO–FeO–SiO_2 ternary system is described. These include the minerals fayalite ($2FeO \cdot SiO_2$), iron monticellite ($CaO \cdot FeO \cdot SiO_2$), and three compositions in the metasilicate series of solid solutions between wollastonite ($CaO \cdot SiO_2$) and $FeO \cdot SiO_2$. The specimens were examined in thin section, and the optical properties are described. Other data determined on these minerals were the reversible thermal expansion between 100° and 1000°C., the density, and the rates of reduction and oxidation in hydrogen and oxygen, respectively. The importance of lime ferrous silicates in slags, sinters, and refractory materials is also discussed. R.A.H.

Thermal insulation: I (Discussion). ANON. *Inst. Fuel War Time Bull.*, **1944,** Dec., pp. 70–72; see *Ceram. Abs.*, **24** [2] 42 (1945). **Appendices.** H. R. FEHLING. *Jour. Inst. Fuel*, **18** [100] 70–71 (1945). 5 references. **II, Economics of saving fuel, with particular reference to the insulation of steam ranges.** G. N. CRITCHLEY. *Inst. Fuel War Time Bull.*, **1944,** Oct., pp. 16–24. 15

references, 7 figures. **Discussion of II.** *Ibid.*, Dec., pp. 73–76.—2 figures. **III, Practical aspects of reheating and heat-treatment furnace insulation.** A. STIRLING. Presented at meeting of Institute of Fuel, Birmingham, Nov., 1944; abridged in *Jour. Inst. Fuel*, **18** [99] 39–51 (1944). **Discussion of III.** *Ibid.*, [100] 72–73 (1945). **IV, Thermal insulation of buildings.** N. S. BILLINGTON. *Ibid.*, [100] 62–69. 35 references, 4 figures. **Discussion of IV.** *Inst. Fuel War Time Bull.*, **1945,** April, pp. 175–77. **V, Heat losses and the insulation of open-hearth furnaces and blast furnaces.** J. M. FERGUSON. *Ibid.*, pp. 141–50, 166.—Thermal efficiency of the open-hearth furnace, distribution of heat losses, effect of insulation on heat losses, design and fuel consumption, insulation of producer-gas mains, application of insulating materials, and insulation of blast furnaces are discussed. Special insulating materials for open-hearth furnaces are semi-refractory brick made from fire clay or china clay impregnated with diatomite, cork sawdust, etc., which leave the clay porous after firing, e.g., vermiculite, slag wool, mineral wool, and artificial mixtures. 1 appendix, 26 references, 7 figures. See *Ceram. Abs.*, **24** [5] 90 (1945). **Discussion of V.** *Inst. Fuel War Time Bull.*, **1945,** June, pp. 211–17. **VI, Thermal insulation as applied to pottery furnaces, kilns, and carbonizing plant.** J. S. F. GARD. *Ibid.*, April, pp. 151–66.—Costs, theory, and detailed methods of insulating, as well as methods of avoiding six other sources of heat loss, are given. 12 references, 35 figures. **VII, Insulation of heat-treatment furnaces.** R. J. SARJANT. *Ibid.*, June, pp. 189–202, 219. 1 appendix, 22 references, 14 figures. See *Ceram. Abs.*, **24** [8] 144 (1945). D.G.P.

Thermal insulation of boilers (discussion). G. N. CRITCHLEY ET AL. *Inst. Fuel War Time Bull.*, **1945,** June, pp. 203–10. 4 figures. D.G.P.

Wartime aluminum and magnesium production. HANS A. KLAGSBRUNN. *Ind. Eng. Chem.*, **37** [7] 608–17 (1945).—Details on the production of alumina are included. 2 figures. F.G.H.

SEPARATE PUBLICATION

Report of the Livesey Professor for the Session 1941–42. D. T. A. TOWNEND. Univ. Leeds, Dept. Coal Gas and Fuel Inds., 1942. 16 pp. Abstracted in *Inst. Fuel War Time Bull.* [loose paper in *Jour. Inst. Fuel*, **16** [90] (1943)], p. 18.—Researches dealing with the emission from refractory materials in contact with flame and the constitution of British refractory clays are included. D.G.P.

PATENTS

Converting hydrous magnesian silicates into basic products. H. R. BRANDENBURG (Idaho Maryland Mines Corp.). U. S. 2,384,008, Sept. 4, 1945 (Sept. 19, 1942). 9 claims. Cl. 23-201.—8. The process of obtaining available magnesian oxide from serpentine which consists in wet grinding the material to a fine mesh in which each particle has a surface area of 250 cm.²/gm. or over, subjecting the material to heat for converting the water into steam, agitating the material in the presence of steam, and in raising the temperature until it lies between 800° and 1500°F. and maintaining this temperature until the material contains a residual water of combination content of between 0.6 and 8.0%, as represented by loss on ignition.

Furnace lining. SILIKA- UND SCHAMOTTE-FABRIKEN MARTIN & PAGENSTECHER A.-G. (Kamillo Konopicky, inventor). Ger. 730,882, Jan. 28, 1943 (May 4, 1940); cl. 80*b;* abstracted in *Chem. Zentr.*, **1943,** I [19] 2024.—A lining of fired silicon carbide brick with quartz binder or a binder of similar silicic acid products is used for furnaces in which $BaCO_3$ or similar BaO-containing products are disintegrated to BaO. M.HA.

Manufacture of highly refractory products of chromium ore and zirconium which are resistant to temperature fluctuations and slags. "BROHLTAL" A.-G. FÜR STEIN U. TONINDUSTRIE (Hans Pohl, inventor). Ger. 735,594, May 19, 1943 (Nov. 1, 1938); cl. 80*b;* abstracted in *Chem. Zentr.*, **1943, II** [13] 1220.—Mixtures of 65 to 90% of unfired chromium ore of 0.5- to 4-mm. grain size and 35 to 10% of crude finely ground zirconium ore, about one third of the zirconium being red mud, are formed and fired. M.HA.

Manufacture of silicon carbide brick. SILIKA- UND SCHAMOTTE-FABRIKEN MARTIN & PAGENSTECHER A.-G. Belg. 447,949, July 30, 1943 (Nov. 12, 1942); abstracted in *Chem. Zentr.*, **1944, II** [3/4] 152–53.—The brick are made by using, as binder, SiO_2 that orginates from the partial oxidation of silicon carbide. M.HA.

Producing cast refractory. T. E. FIELD AND H. T. SMYTH (Corhart Refractories Co.). U. S. 2,381,945, Aug. 14, 1945 (April 10, 1940). 7 claims. Cl. 106-40.—1. The hereinbefore described method of producing a refractory casting free from large voids which comprises casting the molten refractory, filling the pipe formed by the crystallization thereof with additional molten refractory mixed with a sulfate capable of dissociating sulfur trioxide at temperatures between 400° and 1100°C., and dissociating the sulfur trioxide by the heat present in the refractory prior to its solidification.

Producing magnesium sulfate. H. R. BRANDENBURG (Idaho Maryland Mines Corp.). U. S. 2,384,010, Sept. 4, 1945 (June 8, 1943). 13 claims. Cl. 23-128.—8. The process of producing magnesium sulfate from serpentine containing silica and calcium salts which comprises calcining finely ground serpentine just short of a dead roast for freeing the magnesium oxide content from the calcine, subjecting the calcine to the action of a solution of sulfurous acid to convert substantially all of the available magnesium oxide of the calcine into sulfite of magnesium, filtering the slurry to separate out the solid waste matter and to obtain a clear solution containing magnesium sulfite, heating the filtrate to remove the greater portion of the free sulfur dioxide and to oxidize the sulfite salts to sulfate salts, spraying the filtrate by compressed ozonified air to form sulfate salts and sulfuric acid from existing remnants of sulfurous acid and sulfite salts, adding additional calcine to precipitate iron as hydrated oxide and to form additional magnesium sulfate, concentrating the filtrate by evaporation until the silica and calcium sulfate are salted out, leaving the magnesium sulfate, filtering the filtrate to obtain a clear liquor, and in evaporating the liquor to obtain pure magnesium sulfate. 11. The process of producing magnesium sulfate from magnesium oxide which comprises forming a solution of magnesium sulfite with traces of magnesium sulfate and some free sulfurous acid by treating the magnesium oxide with sulfurous acid in greater than stoichiometric proportions, expelling sulfur dioxide gas and converting magnesium sulfite to magnesium sulfate by heating and agitating the solution, oxidizing the remaining sulfurous acid to sulfuric acid and the metal sulfites to sulfates by subjecting the solution to the action of a gaseous oxidizing agent, and then separating the magnesium sulfate from the solution by crystallization.

Recovering magnesium salts. H. R. BRANDENBURG (Idaho Maryland Mines Corp.). U. S. 2,384,009, Sept. 4, 1945 (Oct. 23, 1942). 13 claims. Cl. 23-50.—5. The process of recovering a magnesium-salt solution from unstable hydrous magnesium silicate, such as serpentine, genthite, and garnierite, comprising calcining the silicate to a point at which its residual water of combination is below 8% but short of complete dehydration and without dead burning, agitating the resulting calcine in an acid solution until the acid has been consumed, adjusting the pH value to not less than 6, separating the gangue from the slurry, elevating the temperature of the resulting solution to boiling to convert any soluble silica that may be present to insoluble flocculent form, separating the flocculated silica from the solution, precipitating and separating from the solution any remaining metallic impurities, and finally isolating the desired magnesium salt.

Refractory mass for the manufacture of brick or tamping materials for lining rotating furnaces. VEITSCHER MAGNESITWERKE A.-G. (Karl Albert, inventor). Ger. 723,558, May 15, 1943 (Oct. 22, 1940); cl. 80*b;* abstracted in *Chem. Zentr.*, **1943, II** [13] 1220.—The mass consists

of a basic material of calcined magnesite in fine or granular form (up to about 15 mm.) and firebrick fines with water glass. The mass may also contain iron turnings. M.HA.

Semisilica brick. H. M. KRANER (Bethlehem Steel Co.). U. S. 2,384,180, Sept. 4, 1945 (Dec. 11, 1940). 4 claims. Cl. 106-68.—1. A refractory brick containing 80 to 90% silica, comprising a quartzite of the group consisting of Pennsylvania ganister and Medina quartzite bonded with a fire clay of the group consisting of Pennsylvania and Missouri fire clay and Alabama and Georgia kaolin of less than 0.5% alkali content, the mixture ground to a graduated mesh fineness, shaped, and fired to a heat in the vicinity of cone 15.

Terra Cotta

Alunite as source of scumming on stoneware body. JAN O. KNIZEK AND H. FETTER. *Jour. Amer. Ceram. Soc.*, **28** [9] 256–61 (1945).—7 references, 9 figures.

Stoneware in industry: I. R. WARD AND A. C. H. PRYCE. *Ind. Chemist*, **21** [245] 299–306 (1945).—Pure clay has higher tensile strength than the same clay to which grog has been added. Tensile strength may be increased by higher firing temperature, the use of fluxes and acicular or irregularly shaped grog particles, and by making the shape of the article such as to distribute tension. An average of 25 tons per sq. in. can be assumed as the crushing strength of stoneware having a low porosity and a well-vitrified structure. British Standard Specification No. 784—1938 (*Ceram. Abs.*, **17** [7] 256 (1938)) gives a test for porosity. Resistance to thermal shock or spalling is best produced by the addition of inert aggregates which increase the thermal conductivity, such as silicon carbide. Materials such as fused alumina, zirconium silicate, or silicon carbide can be incorporated in the clay to vary the hardness. 3 photographs. **II.** *Ind. Chemist*, **21** [246] 345–50 (1945).—Allowance for uneven shrinkage, machining, cementing, appearance, chemical resistance (which depends on composition, firing temperature, and porosity), causes of failure, standardization, and distribution of load of stoneware articles are discussed. D.G.P.

PATENTS

Manufacture of sintered gray-colored earthenware. KURT SPANGENBERG AND GEORG BARON. Ger. 730,614, Jan. 14, 1943 (Aug. 29, 1941); cl. 80*b*; abstracted in *Chem. Zentr.*, **1943, I** [20] 2129.—This material is made in an oxidizing fire by using iron ores as coloring agents, e.g., magnetic iron ore (Fe_3O_4), titanium iron ore, or natural or artificial mixtures of these substances. M.HA.

Whiteware

Drawing glost and selecting ware. ANON. *Ceram. Ind.*, **45** [1] 82–86 (1945).—9 illustrations. H.T.

Use of engobes. ANON. *Ceram. Ind.*, **45** [2] 80–84 (1945).—4 illustrations. H.T.

Vernon Kilns formula for popular American dinnerware. ANON. *Ceram. Ind.*, **45** [1] 74–78 (1945).—Production methods used by Vernon Kilns, Los Angeles, Calif., are described. 9 illustrations. H.T.

SEPARATE PUBLICATION

Pottery Tableware. W. W. MEYER, C. D. BLACHLY, ET AL. *U. S. Tariff Comm. Rept., War Changes in Industry Series*, No. 7, 65 pp. (Dec., 1944). 36 tables. Free.—The following subjects are discussed: postwar prospects and problems; materials and processes of manufacture; comparison of production, imports, and consumption; U. S. industry; U. S. exports and imports and their relation to the tariff; U. S. markets and prices; and pottery tableware industries of selected foreign countries. R.A.H.

PATENTS

Application of ceramic color. EUGENE HARDESTY (Fuller Label & Box Co.). U. S. 2,383,190, Aug. 21, 1945 (Aug. 30, 1941). 6 claims. Cl. 117-13.—Method of applying ceramic color to a transfer sheet.

Application of ceramic color. EUGENE HARDESTY (Fuller Label & Box Co.). U. S. 2,383,191, Aug. 21, 1945 (Aug. 30, 1941; Jan. 22, 1945). 3 claims. Cl. 117-13.—Method of applying ceramic color to a surface prepared with an adhesive coating.

Ceramic bodies and method of producing. H. L. CROWLEY AND A. M. HOSSENLOPP (Henry L. Crowley & Co., Inc.). U. S. 2,382,136, Aug. 14, 1945 (March 13, 1943). 2 claims. Cl. 106-46.—1. A method of forming a ceramic from a mixture of talc, clay, a flux, a binder, and a plasticizer dissolved in a suitable solvent therefor, which comprises molding the mixture into a body, prefiring the body at a temperature below the fusing point of the flux, regrinding the body, mixing the reground particles with a binder and a plasticizer dissolved in a suitable solvent therefor, molding the mixture to desired shape, and firing the body at a temperature not greater than 2100°F.

Manufacture of earthenware-like ceramic products with increased mechanical strength and good heat conductivity. STEINZEUGFABRIK EMBRACH A.-G. FÜR KANALISATION UND CHEMISCHE INDUSTRIE. Swiss 221,879, Sept. 1, 1942 (July 5, 1939); abstracted in *Chem. Zentr.*, **1943, I** [19] 2024.—To a Si-containing ceramic mass, alkali or alkaline-earth silicates and amorphous quartz are added simultaneously. Example: a mixture of 35 clay, 15 feldspar, 30 FeSi, 10 steatite [$H_2Mg_3(SiO_4)_3$], and 10% amorphous quartz is made into a paste by holding the pH value above 7.5; the paste is fired at about 1300°C. after molding and drying by avoiding too strong oxidation of the Si. M.HA.

Removal of transfer paper from pottery and other goods. W. BOULTON, LTD., AND R. T. LEWIS. Brit. 570,786, Aug. 1, 1945 (Feb. 12, 1944).

Steatite-type body and method of producing. H. L. CROWLEY AND A. M. HOSSENLOPP (Henry L. Crowley & Co., Inc.). U. S. 2,382,137, Aug. 14, 1945 (May 17, 1944). 4 claims. Cl. 106-46.—1. Insulating bodies having a composition of ingredients in parts by weight comprising ball clay 10, whiting ($CaCO_3$—calcium carbonate) 6, barium carbonate ($BaCO_3$) 24 to 35, zinc oxide (ZnO) 1 to 10, boric acid (H_3BO_3) 1 to 10, and talc 58 to 29.

Equipment and Apparatus

Abrasives tester. ANON. *New Equipment Digest*, **10** [8] 18 (1945).—The apparatus measures abrasive hardness and bond structure precision by means of a diamond or alloy steel grading tool. It is made by the Hanchett Mfg. Co., Big Rapids, Mich. F.C.A.

Absorption by the use of kerosene and a vacuum. MARK SWEITZER. *Bull. Amer. Ceram. Soc.*, **24** [9] 322–23 (1945).—2 figures.

Crushing, grinding, and sieving. W. OTTE. *Wärme*, **66**, 78–80 (1943); abstracted in *Fuel Research Intelligence Section, Summary for June 5 and 12*, **1943**, p. 246; *Woodall-Duckham Co. Tech. Press Rev.*, No. 912, p. 2 (July 7, 1943). —O. describes the fundamental principles of the various methods and appliances used for crushing and grinding solid substances and of sieve analysis and elutriation methods for determining the characteristics of the smalls

and powders obtained. The graphic representation of sieve analyses and particle-size distribution are also discussed.

Essentials of drying by heated air. S. G. SAUNDERS. *Ind. Heating Engr.*, **5**, 43–48 (July, 1943); *Woodall-Duckham Co. Tech. Press Rev.*, No. 912, p. 5 (July 7, 1943).—S. deals with the physical properties of air and water-vapor mixtures and the principles of evaporation as applied to the drying of substances. These factors are common to the many drying problems met in practice and have a major bearing on the results obtained. The types and classification of driers in general use for drying by heated air are indicated. A bibliography of recent literature on the subject is appended.

High temperature, high pressure rheometer for plastics. H. K. NASON. *Jour. Applied Phys.*, **16** [6] 338–43 (1945).—A modified Bingham-type rheometer has been designed for operation up to 500°F. and pressures up to 2000 lb./sq. in. Interchangeable orifice plates permit wide variation of shear conditions. The slowness of the instrument limits its usefulness. 66 references. A.P.

Illuminating system of the electron microscope. JAMES HILLIER AND R. F. BAKER. *Jour. Applied Phys.*, **16** [8] 469–83 (1945).—Variations in the quality of published electron micrographs have been too great. A figure of merit system is proposed for evaluating the performance of an electron microscope. The instrument is extremely sensitive to the adjustment of the illuminating system. By considering the illumination as being produced by a two-lens system, all of the effects observed in connection with the illumination of the specimen can be qualitatively explained. Practical information on the adjustment of the illumination system is given. The cause and elimination of multiple images is discussed. Changes in the design of the electron source and the use of an interchangeable aperture in the condenser lens improve the average performance. A.P.

Investigation of the thermal spalling of chemical stoneware. G. R. RIGBY, H. BOOTH, R. P. WHITE, AND A. T. GREEN. *Bull. Brit. Refrac. Research Assn.*, No. 62 (June, 1942); reprinted in *Trans. Brit. Ceram. Soc.*, **44** [4] 53–62 (1945).—An apparatus is described that is capable of determining the relative resistance to spalling of stoneware bodies over the temperature ranges at which such bodies are used under industrial conditions. For the purpose of the test the specimen was standardized as a cylinder 4 in. tall and 3 in. in external diameter with walls 0.5 in. thick. The spalling was carried out by heating the specimen for 1 hr. to a predetermined temperature in a furnace, followed by cooling for 6 min. in an air blast. For each test it was desirable to subject at least six specimens to a maximum of 10 heating and cooling cycles. The severity of the spalling was controlled by the temperature of the furnace. Bodies did not spall at 250°C., and temperatures of 300° or 350°C. were recommended for the general run of stoneware bodies. In order to differentiate between bodies which had a high resistance to spalling it was necessary to use a maximum furnace temperature of 400°C. R.A.H.

Laboratory autoclave. ANON. *New Equipment Digest*, **10** [7] 18 (1945).—A 1-gal. Alberger autoclave for use up to 3000 lb. pressure is described. The apparatus is provided with a removable stirrer and a safety rupture disk. It is made by the Industrial Machinery Co., Bloomfield, N. J. F.C.A.

Materials for resistance thermometers. ALFRED SCHULZE. *Feinmech. u. Präzision*, **50**, 357–58 (1942); abstracted in *Chem. Zentr.*, **1943, II** [17] 1564.—Resistance thermometers are the most exact up to 500°C., but base metals cannot be used for them because of their low resistance to corrosion, nor can silver and gold because of their crystal growth in heating. Rh, Ru, Os, and Ir are too rare and too difficult to work. Up to 300°, Ni cannot be used because of its magnetic transformation. Up to 1100°, only Pt is suitable. For low temperatures the following metals can be used: Pt to −190°; Au and Pb to −253°; manganin, constantan, and in particular phosphor bronze for temperatures below −253°C. Formulas and resistance values are given. See "Metallic . . .," *Ceram. Abs.*, **23** [7] 127 (1944). M.HA.

Moore-Charlton proportiometer pump. ANON. *Ind. Chemist*, **20** [239] 673–75(1944).—A detailed description is given. It is a positive displacement pump in which the quantity of liquid delivered can be varied from zero to full capacity while the mechanism is operated at constant speed. Setting of the rate of delivery can be made while the pump is in motion. It is a precision instrument made for the most exacting conditions and is a variable capacity plunger pump. 5 figures. D.G.P.

New boron carbide mortar is hardest ever produced. ANON. *Laboratory*, **15** [4] 80–81 (1945).—Boron carbide, B_4C, has a hardness on the Mohs scale of 9.5 and is made at over 5000°F. in an electric furnace. It is much harder than agate or mullite and will not contaminate samples ground in it. It is finished to a mirror finish with diamond tools and has a stainless-steel housing shrunk around it. W.D.F.

New etching pattern of quartz and its uses for the determination of electric axes and the detection of crystalline defects. CHOONG SHIN-PIAW. *Jour. Optical Soc. Amer.*, **35** [8] 552–58 (1945).—A new etch pattern of quartz is formed when a plate cut normal to the optic axis is subjected to the actions of hydrofluoric acid and an electric field simultaneously. With a weak field the pattern consists of a number of regularly oriented triangular figures, which change their orientation from one twinned part to another. With a strong field the triangles are smaller but more numerous, and there also appear groups of parallel long lines and bands as well as new etched zones which are similar in appearance to the ordinary twinned zones but unlike in nature. The groups are exactly parallel to the electric axes of quartz, and their presence affords a convenient way for the determination of the axes. The localities of the new effects may be the seats of new crystalline defects arising from the so-called "primary" crystal flaws. A general and accurate method for the determination of electric axes of quartz and their polarities is based on the use of the orientations of the elementary etch figures. A.P.

New microscopy and its potentialities. CHARLES S. BARRETT. *Amer. Inst. Mining Met. Engrs. Tech. Pub.*, No. 1865; *Metals Tech.*, **12** [3] 50 pp. (1945).—X-ray diffraction is used. The work developed from the study of the internal structure of Laue spots. Changes produced by deformation are seen. Conditions for good images are (1) a specimen surface undistorted by sawing or polishing, (2) a minimum distance from specimen to plate, (3) an X-ray tube with target of low atomic number (Cr, Fe, Co) emitting characteristic radiation, (4) a plate shielded from the direct beam, (5) a plate with high resolving power (fine grain), and (6) examination or enlargement of the plate with good lenses (up to 250×) using transmitted light. So far all the applications have been in metallurgy, but it is possible to use the method on other materials. W.D.F.

Pigment dispersion methods for electron microscopy. H. C. O'BRIEN, JR. *Jour. Applied Phys.*, **16** [6] 370–72 (1945).—In a method of preparing a pigment dispersion for electron microscopy, the pigment is first wetted with water and then dispersed in a cellulose acetate solution. Another method avoids mechanical or chemical damage of the particles by use of an electrostatic dispersion apparatus. A.P.

RCA Victor electron microscope and its application in the ceramics industry. C. W. SMITH. *Jour. Can. Ceram. Soc.*, **14**, 37–46 (1945).—Ceramic raw materials lend themselves ideally to electron microscopy. From a study of particle size, shape, and distribution, a thorough knowledge of the physical and chemical properties can be obtained that will result in a better ceramic product. S. describes the operation of two types of electron microscopes with special emphasis on their application to ceramics. G.A.K.

Schlieren and shadowgraph equipment for air flow analysis. N. F. BARNES AND S. L. BELLINGER. *Jour. Optical Soc. Amer.*, **35** [8] 497–509 (1945).—Experimental

details for obtaining schlieren and shadowgraph observations and photographs are described. 127 references, 7 figures. A.P.

Spectrophotometric method for analysis of multicomponent mixtures and its infrared application. R. R. BRATTAIN, R. S. RASMUSSEN, AND A. M. CRAVATH. *Jour. Applied Phys.*, **14** [8] 418–28 (1943).—A general method for spectrophotometric analysis of multicomponent mixtures is based on the assumption that the optical density of a mixture equals the sum of the optical densities of the components, even though the transmissions of the individual components may not follow Beer's law. Application of the method to infrared absorption of vapor samples is described, and results are given for tests using six-component hydrocarbon mixtures. The method is most suitable for rapid routine analysis of large numbers of samples containing the same known components and therefore for plant-control purposes. See "Rapid. . .," *Ceram. Abs.*, **22** [11] 198 (1943). A.P.

Steels for high-temperature service. R. SERGESON. Presented at meeting of American Society for Metals, Pittsburgh; *Ind. Heating*, **12** [7] 1209–10, 1214 (1945). M.HA.

Techniques for evaporation of metals. L. O. OLSEN, C. S. SMITH, AND E. C. CRITTENDEN, JR. *Jour. Applied Phys.*, **16** [7] 425–34 (1945).—Thirty-four elements have been observed for evaporation behavior in the preparation of reflecting surfaces. A table summarizes the best technique for each metal in small or large quantities. The heaters were wires or crucibles. Tungsten, iron, nickel, and Chromel were used for wires and were wound into conical baskets and helical coils. Alundum and BeO crucibles, formed by painting suspensions of these materials on a tungsten conical basket and then baking at high temperatures, served well even for metals whose evaporation temperatures approached 2000°C. A.P.

Use of retardation plates in spectrophotometry: I, Determination of slit shape and slit width. G. L. BUC AND E. I. STEARNS. *Jour. Optical Soc. Amer.*, **35** [7] 458–64 (1945).—A retardation plate is used to make a calibrator having a known transmission curve which can be used to evaluate slit width and the shape factor. Two spectrophotometers that give similar transmission data for a calibrator will give similar curves for other types of samples. **II, Calibration of wave length.** *Ibid.*, pp. 465–70.—On the criterion that a correctly calibrated spectrophotometer will give the same transmission curve for straight-line absorptions as would be obtained with monochromatic light, the calibrator of Part I may be used for wave-length calibration. **III, Measurement of dichroic samples.** *Ibid.*, [8] 521–24.—Polarized-beam spectrophotometers modified by the addition of a thick retardation plate will duplicate the results of absorption measurements on dichroic samples obtained with unpolarized light. A.P.

Use of suspensions as heavy liquids. L. W. NEEDHAM AND S. LYNCH. Presented at joint meeting of Chemical Engineering Group with the Institution of Chemical Engineers, London, May, 1945; abstracted in *Ind. Chemist*, **21** [246] 372–78 (1945).—Coal cleaning, mineral dressing, wet grinding in ball mills, etc., are discussed. D.G.P.

PATENTS

Classifying system for pulverized materials. HARLOWE HARDINGE. U. S. 2,381,954, Aug. 14, 1945 (Aug. 3, 1940). 16 claims. Cl. 209-144.

Grinding, crushing, and pulverizing machinery. G. CLARK AND W. CLARK. Brit. 570,709, Aug. 1, 1945 (Jan 12, 1944).

Manufacture of carbon electrodes by pressing. ARNE SUNDELIN. Dan. 60,117, Sept. 7, 1942 (March 26, 1941); abstracted in *Chem. Zentr.*, **1943, 1** [22] 2327.—Electrically conducting carbon is mixed with a binder that has a softening point above the temperature of service and is neutral with respect to the electrolytes of the electrical element and with fillers. The mixture is heated to temperatures above those at which the binder becomes plastic and then pressed. Suitable binders are sulfur; polymers of vinyl chloride, styrole, or similar substances; and fillers (asbestos, quartz, glass, porcelain). M.HA.

Measuring device. DEUTSCHE GOLD- UND SILBER-SCHEIDEANSTALT VORM. ROESSLER. Ital. 390,306, July 14, 1941; abstracted in *Chem. Zentr.*, **1943, I** [19] 2024.—The measuring device consists, wholly or at the parts subject to wear, of a highly refractory, hard ceramic material (metal oxides, carbides, etc.), such as Al_2O_3 or BeO, which has a hardness of 8 according to Mohs' scale. M.HA.

Viscometer. KENNETH DEMB (Sylvania Electric Products, Inc.). U. S. 2,382,979, Aug. 21, 1945 (June 24, 1944). 4 claims. Cl. 73-59.—2. In a viscometer of the type in which a rotating sample develops a recordable torque upon a vane immersed therein, a container comprising a first cup in which the sample is received, a second cup surrounding and in communication with the bottom portion of the first cup, the rim of the second cup being positioned to maintain a predetermined average liquid level a short distance below the rim of the first cup, an overflow cup embracing and supporting the first and second cups, and a rotatable shaft upon which the cups are mounted having a longitudinal opening extending therethrough and in communication with the overflow cup.

Kilns, Furnaces, Fuels, and Combustion

ABC's of wood fuel. R. B. BOALS. *Power*, **89** [3] 152–54 (1945).—B. details the basic fundamentals of woodburning. 4 figures. F.G.H.

American research on coal processing and utilization. ANON. *Coal Age*, **48** [2] 111; abstracted in *Coke & Smokeless-Fuel Age*, **5**, 99–100 (May, 1943); *Woodall-Duckham Co. Tech. Press Rev.*, No. 905, p. 2 (May 19, 1943).—The U. S. Bureau of Mines has started new coal researches where needed to support the war effort. A classified list of investigations shows which were inaugurated, completed, or suspended during 1942 and which are still in progress. Important results are expected from investigations on the use of anthracite or other noncoking material to improve the structure of coke, reduce stresses on oven walls by facilitating the escape of gases, and shorten coking times, thus increasing output. Summaries are given of a number of trials of coals and carbonization processes.

Aspects of gas-producer practice. E. M. BROWN. *Ind. Chemist*, **20** [237] 552–57 (1944). D.G.P.

Assay of coal for carbonization purposes. JOSEPH BROWN. *Inst. Fuel War Time Bull.*, **1944**, Dec., pp. 41–49.—21 references, 13 figures. D.G.P.

British Coal Utilisation Research Assn. Opening of new laboratories at Coombe Springs. ANON. *Inst. Fuel War Time Bull.*, **1943**, Aug., pp. 27–28.—Exhibits included apparatus used in researches on the colloidal properties of coal and differences in coke structure obtained with coals of different rank, furnaces capable of reaching temperatures up to 2000°C. and special refractory materials developed for use in them, work on the size-grading of coal and the classification of industrial slacks, corrosive gases, the formation and prevention of deposits which affect the operation of large boiler plants, and a new coal fire. A card index contains over 100,000 abstracts of nearly every paper or publication on fuel subjects that has appeared in any country during the past ten years. D.G.P.

Cleaning of producer gas. G. DOUGILL. Presented at meeting of Institution of Chemical Engineers and the Chemical Engineering Group, Jan., 1945; abstracted in *Ind. Chemist*, **21** [241] 56–60 (1945). D.G.P.

Coal research: its foundations and principles. F. J. NORTH. *Discovery*, **4**, 207–209 (July, 1943); abstracted in *Brit. Coal Utilisation Research Assn. Bull.*, **7**, 196 (Sept., 1943); *Woodall-Duckham Co. Tech. Press Rev.*, No. 925,

p. 3 (Nov. 3 and 10, 1943).—N. discusses in general terms the geological history of coal and the consequent variations in coal properties to which present scientific research is directed so that each kind of coal may be used to the best advantage.

Coal tar fuels. E. BRETT DAVIES. *Jour. Inst. Fuel*, **18** [100] 82–84 (1945).—A discussion. D.G.P.

Coal utilization research. Report of the Parliamentary and Scientific Committee on Coal Research and National Economy. *Gas World*, **118**, 518–24 (May 15, 1943); *Brit. Steelmaker*, **9**, 248–54 (June, 1943); abstracted in *Woodall-Duckham Co. Tech. Press Rev.*, No. 905, p. 2 (May 19, 1943).—The Committee reports on the present state of the coal industry, coal resources, and coal research in Great Britain and makes recommendations for future coal-utilization research. The importance of the development of the national coal survey is emphasized, and a number of research projects are suggested. The cost of the proposed research program is discussed.

Coke from Illinois coals. Experimental slot-type oven. FRANK H. REED, HAROLD W. JACKMAN, AND P. W. HENLINE. *Ind. Eng. Chem.*, **37** [6] 560–66 (1945).—A research program includes the design, construction, and operation of a pilot-size coke oven to duplicate carbonizing conditions in commercial slot-type ovens. A slot-type pilot-size coke oven of 500-lb. coal capacity, electrically heated to insure accurate temperature control, is described. Details of its refractory requirements are illustrated. The yields and properties of the coke and by-products recovered from this small experimental oven correlate closely with those obtained by carbonizing the same coals in commercial ovens. This oven is therefore a reliable guide for commercial operations. 4 references, 6 figures. See "Domestic. . .," *Ceram. Abs.*, **24** [1] 18 (1945). F.G.H.

Combustion equation. BOLESLAW SZCZENIOWSKI. *Rev. trimestr. can.*, **28**, 380–92 (1942); *Chem. Abs.*, **37**, 1581 (1943).—S. derives a combustion equation applicable to either solid or liquid fuels, based on the composition of the fuel under study. By the determination of CO_2 and O_2 only in the exhaust gases, the coefficient of excess air and the amount of CO present can be ascertained by means of a nomograph based on the composition of the fuel. The combustion equation is given as $(1 + \alpha)k_1 + (0.605 + \alpha)k_2 + o = 21$, where $k_1 = \%CO_2$ by volume, $k_2 = \%CO$ by volume, and $o = \%O_2$ by volume, and α, the composition coefficient, equals $2.37\frac{[H + 0.125\,(S - O)]}{C}$, where C, H, S, and O are, respectively, the percentages by weight of C, H, S, and O in the fuel.

Conference on the preparation and utilization of coal: I, Coal preparation. J. C. MITCHESON. *Jour. Inst. Fuel*, **18** [101] 94–98 (1945). **II, Coal requirements of the gas industry.** H. C. APPLEBEE, H. H. THOMAS, AND T. A. TOMLINSON. *Ibid.*, p. 99. **III, Coal required by the iron and steel industry.** H. C. ARMSTRONG. *Ibid.*, p. 100. **IV, Coal suitability—the electric industry.** ANON. *Ibid.*, pp. 101–102. **V, Coal supply and the appliance maker.** P. A. H. ELLIOT. *Ibid.*, pp. 103–104. **VI, Mechanical stoker and the utilization of coal.** H. E. PEARSALL. *Ibid.*, pp. 104–105 (see *Ceram. Abs.*, **24** [7] 129 (1945)). **VII, Locomotive coal.** M. G. BENNETT. *Jour. Inst. Fuel*, **18** [101] 106 (1945). **VIII, Fundamental factors concerning the performance of shell-type boilers, related to the choice of fuels.** E. G. RITCHIE. *Ibid.*, pp. 107–108, 113. D.G.P.

Continuous determination of oxygen and combustibles. J. F. LUHRS. *Iron & Steel Engr.*, **22** [5] 45–51 (1945).—A portable continuous oxygen recorder consists of two units, the analyzer and the recorder. The analyzer mixes a continuously flowing sample of flue gas with the vapor from a standardized liquid fuel. Heat of combustion is measured by the change of resistance of a filament. The maximum time lag between sampling and recording is about 10 sec. A combustibles recorder operates on the same principle. A sampler is described that does not become clogged with dirt or slag in the flue gas. The proper location of samplers is discussed. B.L.

Control of furnace dampers. ANON. *Iron & Coal Trades Rev.*, **150** [4032] 849–50 (1945); *Engineer*, **179** [4662] 397 (1945).—A new damper control (developed by the Incandescent Heat Co.) is described that maintains correct atmosphere conditions within the furnace chamber in terms of pressure and is sensitive to pressure variations of less than 0.001 in. w.g. The damper is adjusted by an ultrasensitive manometer. The CO_2 in the waste gases was kept constant within 0.25% by the control in a furnace where the temperature was increased from 600° to 850°C. and then maintained at this temperature, for a CO_2 content of 10.0 to 10.50%. M.HA. & G.A.K.

"Cyclone" grit arrester. ANON. *Steam Engr.*, **13**, 63 (Nov., 1943); abstracted in *Woodall-Duckham Co. Tech. Press Rev.*, No. 925, p. 6 (Nov. 3 and 10, 1943).—A diagrammatic description is given of a grit arrester designed by Matthews and Yates, Ltd. Its essential feature is that the air or gas to be cleaned must pass through slotted diaphragms so designed that the air is separated from the dust or other suspended matter by passing through the slotted diaphragms in a tangential and partially backward direction to the air flow set up by the fan.

Fine temperature control. M. L. TOWNSON AND R. BARRINGTON BROCK. Presented at meeting of London Section, Society of Chemical Industry; abstracted in *Ind. Chemist*, **21** [240] 31–35 (1945). D.G.P.

Flocculation and flotation principles in the recovery of low-grade fuels. J. O. SAMUELS. *Inst. Fuel War Time Bull.*, **1945**, Feb., pp. 103–11.—40 references, 7 figures. **Discussion.** *Ibid.*, June, pp. 220–22. D.G.P.

Fuels and fuel economy. G. W. M. REES. *Claycraft*, **18** [8] 310–18 (1945).—R. describes the present-day problem of fuels under the following headings; (1) present-day work, (2) methods adopted, (3) percolation method, (4) high volatile, (5) zones, (6) immediate contact, (7) clean boilers, (8) substitute fuels, (9) coke, (10) gaseous fuel, (11) surface combustion, (12) use of town gas, and (13) permeable refractories. G.A.K.

Function of recuperation in direct-fired tunnel kilns. P. DRESSLER. *Jour. Can. Ceram. Soc.*, **14**, 60–64 (1945).—In a large proportion of direct-fired kilns there has been a neglect of the recuperation of heat from the cooling ware in the form of hot air for burning the fuel. This situation is likely to change as we exhaust the more available and cheaper sources of high-grade fuels. At a temperature of 2300°F., corresponding to a bisque fire, the heat theoretically available to supply losses from radiation, conduction, etc., and to heat the ware is 210 B.t.u. per cu. ft. of natural gas burned. If all the combustion air is heated to 1500°F., the sensible heat brought in is 371.9 B.t.u., making a total of 581.9 B.t.u. available. If 3 cu. ft. of air is at 70°F. and the remainder preheated to 1500°F., the total heat available is 498.7 B.t.u. G.A.K.

Future of coal. J. G. BENNETT. Presented at Conference on Ultra-Fine Structure of Coals and Cokes, London, June, 1943; abstracted in *Ind. Chemist*, **19** [222] 363–64 (1943). D.G.P.

Gas analysis by thermal conductivity measurements: I, Physical assumptions. F. LIENEWEG. *Arch. tech. Messen*, **1942**, No. 138, T.125–26; abstracted in *Fuel Research Intelligence Section, Summary for Oct. 16 and 23*, **1943**, p. 438; *Woodall-Duckham Co. Tech. Press Rev.*, No. 926, p. 6 (Nov. 17 and 24, 1943).—The possibilities of gas analysis by measuring the thermal conductivity are discussed in the light of examples and diagrams of the variations of the measurements, with particular reference to gaseous mixtures of more than two components. **II, Technical uses.** *Arch. tech. Messen*, **1943**, No. 140, T.17.—Various methods of applying thermal-conductivity measurements are described, including analysis of flue and exhaust gases, control of aviation motor exhausts, CO_2 determinations, H_2 analysis for detecting leakages in gas holders, for the control of blast furnaces and producers, and in hydrogenation and nitrogen-synthesis processes.

Gasification of bituminous coal in producers. P. M. K. EMBLING. *Jour. Inst. Fuel*, **18** [101] 114–23 (1945). D.G.P.

Heat content of the products of combustion. E. L. LULY ET AL. *Inst. Fuel War Time Bull.*, **1944,** April, pp. 137–39.—Written contributions to a paper by Luly (*Ceram. Abs.*, **24** [7] 129 (1945)) are presented, together with the theoretical derivation of the formulas put forward for the calculation of the heat content of products of combustion. D.G.P.

How to convert a gas analysis. E. N. KEMLER. *Power*, **88** [8] 513 (1944).—K. gives instructions for the conversion of a gas analysis from (1) a volume basis to a weight basis and (2) a weight basis to a volume basis. F.G.H.

How to plot CO_2-excess-air curve for natural gas. P. SWAIN. *Power*, **89** [6] 393–94 (1945). F.G.H.

Improvements in the use of fuels in everyday practice. H. C. ARMSTRONG. *Inst. Fuel War Time Bull.*, **1944,** Dec., pp. 63–66, 68.—A discussion. D.G.P.

Methods for the determination of carbon and hydrogen in coal and their practical utility. H. T. PINNOCK ET AL. *Inst. Fuel War Time Bull.*, **1944,** Dec., pp. 50–54, 57.—Written contributions to a discussion of papers by Belcher, Spooner, and Fenton. D.G.P.

Microanalysis of ash. F. FUCHS. Presented at meeting of American Gas Assn., Chicago, Oct., 1942; abstracted in *Amer. Gas Assn. Proc.*, **1942,** p. 314.—The determination of the ash of coal is simplified and the time required for a determination is shortened by applying procedures of micro- and semimicro-analysis. By using samples of coal of 3 to 50 mg., ash determinations were made giving results consistent with those of standard determinations. The heating time required was 20 to 30 min. for each determination. M.R.

Mineral industries research—endowment policy for Pennsylvania. A. W. GAUGER. *Mineral Industries (Penna. State Coll.)*, **12** [8] 1, 3–4 (May, 1943); abstracted in *Colliery Eng.*, **20,** 226 (Oct., 1943); *Woodall-Duckham Co. Tech. Press Rev.*, No. 923, p. 2 (Oct. 6 and 13, 1943).—A program of research commenced at Pennsylvania's Mineral Industries Experiment Station in 1940 included laboratory study on the properties of anthracite of importance in water-gas manufacture, plant-scale tests, a survey of operating methods and data for gas plants using anthracite, and the use of anthracite as a cupola fuel. Studies are in progress on the conversion of coal into carbons, plastics, and other chemical materials.

Molecular nature of coking coal bitumens. H. E. BLAYDEN, J. GIBSON, AND H. L. RILEY. *Inst. Fuel War Time Bull.*, **1945,** Feb., pp. 117–29. D.G.P.

Natural gas combustion charts. P. SWAIN. *Power*, **89** [5] 308–309 (1945).—S. explains flue-gas loss charts that are exact for methane and commercially accurate for any natural gas containing not less than 70% methane. 2 figures. F.G.H.

New specific heats and energy charts for gases. E. W. GEYER. *Engineering*, **159** [4140] 381–83; [4142] 423–24 (1945).—In orginal publications giving new quantum specific heat data, the values of the specific heats were given at fairly wide temperature intervals. For the energy chart, constant-volume entropy values are also necessary and these have been determined by G. For the purpose of redesigning the energy chart, it was preferable to commence the internal-energy and total-heat curves from absolute zero temperatures, and this necessitated the determination of quadratic equations for the values of C_v between 0° and 600°F. abs. G. gives a short description of the principles upon which the energy chart is based, followed by the application of the chart to a few typical internal-combustion engine cycles. G.A.K.

Rational flue formula for gas-fired industrial ovens with natural draft burners. G. A. PETERSON. *Nat. Gas Bull. Australia*, **7,** 24–26 (July-Aug., 1943); abstracted in *Woodall-Duckham Co. Tech. Press Rev.*, No. 927, p. 9 (Dec. 1 and 8, 1943).—The formula $A = 0.32 \frac{Q}{\sqrt{H}}\left(1 + \frac{E}{115}\right)$, where A = flue-outlet area (sq. in.), Q = maximum gas rate (cu. ft./hr.), H = effective flue head (in.), and E = % excess air, has been found satisfactory on a large number of ovens in the Australian Gas Light Co. area. The modification proposed by A. R. Wayman, viz.,

$$A = \frac{Q\left(\text{CV gross} + \frac{E}{100}\text{ CV net}\right)}{1560\sqrt{H}},$$

should prove quite suitable.

Relationship of ash constitution to clinkering in "blower" coals. E. SWARTZMAN. *Can. Chem. Process Inds.*, **27** [12] 676–80 (1943).—The Bureau of Mines (Ottawa) studied Canadian coals to determine which, alone or mixed, were suitable for use as domestic blower fuel. Under certain conditions, adjustment of the silica-alumina to iron oxide ratio produced a satisfactory clinker. An addition of 15 to 75 lb. of oxide per ton of coal was necessary. The use of alkalis is unsatisfactory. B.L.

Research grants by the Buhl Foundation for basic studies in chemistry: I, Coal Research Laboratory of the Carnegie Institute of Technology. ANON. *Chem. Eng. News*, **21,** 359–61 (March 25, 1943); abstracted in *Woodall-Duckham Co. Tech. Press Rev.*, No. 905, p. 2 (May 19, 1943).—A brief summary is made of the work of the Laboratory since its inception in 1930. The investigations carried out include projects relating to coal and coke analysis, coal carbonization, solvent refining of coal tar, coal hydrogenation, and the action of solvents on coal.

Symposium on methods of measurement of heat absorption in furnaces: Temperature measurement of a steel slab under normal steel plant operation. F. S. BLOOM. Presented at meeting of American Society of Mechanical Engineers, New York, Nov., 1944; *Ind. Heating*, **12** [3] 402–408 (1945). **Measuring heat rates in the charge in furnaces.** V. PASCHKIS. *Ibid.*, [5] 772–78, 806. **New method for measurement of fluid flow applicable to studies of convective heat transfer.** A. KOLIN. *Ibid.*, [6] 946–52. **Thermal conductivity of laminated metals.** J. L. FINCK. *Ibid.*, [7] 1132–38. **Measurement of heat flow from furnace walls.** CHARLES B. BRADLEY. *Ibid.*, [8] 1318–20. M.Ha.

Thermal data for use in chemical-technical calculations. M. W. TRAVERS. *Inst. Fuel War Time Bull.*, **1944,** Dec., pp. 55–57. **Errata.** *Jour. Inst. Fuel*, **18** [100] 69 (1945). D.G.P.

Ultimate analysis from proximate: a new method. GLENN C. BOYER. *Power*, **89** [3] 173–75, 178 (1945).—B. shows how to convert proximate coal analysis into ultimate with sufficient accuracy for combustion calculations. 3 figures. F.G.H.

SEPARATE PUBLICATIONS

Annual Report of Research and Technologic Work on Coal, Fiscal Year 1944. A. C. FIELDNER, P. L. FISHER, AND R. E. BREWER. *U. S. Bur. Mines Information Circ.*, **7322,** 79 pp. (1945). 18 figs. Free. R.A.H.

Bibliography of Bureau of Mines Investigations of Coal and Its Products, 1935 to 1940. A. C. FIELDNER. *U. S. Bur. Mines Tech. Paper*, **639,** 43 pp. (1942). Price 10¢ from Supt. of Documents, Washington, D. C.—F. presents a bibliography of publications from 1935 to Jan. 1, 1940, of Bureau of Mines investigations of coal and its products. *Tech. Paper* **576** is a similar listing for 1910 to 1935. A combination of the two covers publications since the beginning of the Bureau. R.A.H.

Glossary of Terms Used in the Gas Industry. British Standard Specification No. 1179—1944. British Standards Inst., London. Price 3*s.* 6*d.* post free. Reviewed in *Jour. Inst. Fuel*, **18** [99] 58 (1944). D.G.P.

Textbook of Fuels and Their Efficient Utilization for the Use of Students and Technical Men in Industry. H. M. Stationery Office, London. viii + 807 pp., 303 illustrations, 135 tables. Price 12*s.* 6*d.* Reviewed in *Jour. Inst. Fuel*, **18** [99] 58 (1944). D.G.P.

Third Report of the Committee on the Brick Industry. O. SIMMONDS, Chairman. Ministry of Works, H.M.S.O., London, 1943. 58 pp.; abstracted in *Fuel Research Intelligence Section, Summary for April 24 and May 1,* **1943**

pp. 174–75; *Woodall-Duckham Co. Tech. Press Rev.*, No. 906, p. 3 (May 26, 1943).—In section XLVII (Fuel), recommendations are made regarding fuels that can be used when it is necessary to replace the more satisfactory coals. In section XLVIII are given practical recommendations for economy in the use of brick oil. Appendix V deals with fuel for firing brick kilns. **Appendix VII, Preliminary Consideration of the Firing of Common Brick.** 24 pp.—The main factors associated with the firing of common brick are indicated, and problems connected with them are discussed.

PATENTS

Electrical resistance. N. V. PHILIPS' GLOEILAMPENFABRIEKEN. Belg. 446,915, Aug. 22, 1942; abstracted in *Chem. Zentr.*, **1943, II** [17] 1569.—The resistance material consists of FeO-Fe_2O_3, MgO and Al_2O_3, and a homogeneous spinel phase which, at about 500 °C., is not oversaturated with a second phase. The molecular ratio of MgO to Al_2O_3 is about 1. M.HA.

Pottery ovens or kilns. S. J. ALLPORT. Brit. 570,335, July 18, 1945 (Sept. 28, 1943).

Solid smokeless fuel. D. L. FREW. Brit. 556,332, Oct. 13, 1943 (March 30, 1942); abstracted in *Woodall-Duckham Co. Tech. Press Rev.*, No. 924, p. 2 (Oct. 20 and 27, 1943).—Small coal or coal dross (below 0.25-in. mesh) with a volatile content of 30 to 40% and a C content of 45 to 65% is mixed with granulated peat and a binder of pitch, bitumastic emulsion, etc., briquetted, and heated to 400° to 500 °C. to carbonize only the surface skin and form a hard surface layer.

Geology

Absorption and excitation of zinc silicate phosphors. C. K. LUI. *Jour. Optical Soc. Amer.*, **35** [7] 492–94 (1945).—Excitation spectrum of zinc silicate phosphor showed two bands: (1) major between 2250 and 2900 a.u. and (2) minor between 1950 and 2250 a.u. Absorption measurements for zinc silicate phosphor showed a band located between 2000 and 3000 a.u. These results indicate that the excitation spectrum of a phosphor also measures the absorption of that phosphor. A.P.

Base exchange of crystalline silicates. STERLING B. HENDRICKS. *Ind. Eng. Chem.*, **37** [7] 625–30 (1945).—Concepts fundamental for an understanding of base exchange by silicates are presented. The principal types of crystalline silicates showing considerable cation exchange capacity have framework or sheetlike structures. Zeolites belong to the first class in which exchange of cations depends upon the presence of multiconnected voids. Clay minerals and other micaceous silicates have sheetlike structures in which external cations are necessary for microscopic neutrality. These cations are principally on the cleavage surfaces of the montmorillonite minerals and on the lateral faces of kaolin minerals. Both types of positions contribute prominently to the cation exchange of the micalike minerals, glauconite and illite. Orders of cation replacements are determined by relative values of interaction forces between the cation and the adjoining lattice. 21 references, 5 figures. F.G.H.

Concentrate shipping costs reduced by rotary drier. W. H. FREUDENBERG. *Eng. Mining Jour.*, **146** [6] 87 (1945).—Zinc concentrates were formerly shipped wet from the mill at Cardin, Okla. They settled out en route, due to the vibration of the freight cars, forming a mushy mass difficult to handle. A gas-fired rotary drier at 2300 °F. is now used. The fine dust produced is caught by a Cyclone collector and a Roto-Clone separator, which uses a water spray. 1 figure. W.D.F.

Continued expansion expected for lithium industry. ANON. *Eng. Mining Jour.*, **146** [6] 81 (1945).—Lithium is used as a hydrogen carrier, in alloys, storage batteries, air conditioning, and greases, and as a vacuum tube "getter." Lithium carbonate is used in some glasses, and lithium has other ceramic uses to prevent crazing. W.D.F.

Fluorite in India. N. L. SHARMA. *Trans. Indian Ceram. Soc.*, **3** [1] 35–41 (1944).—A mineralogical description of fluorite (CaF_2), containing 48.9% fluorine when pure, precedes a geographical survey of India's fluorite deposits. The most important locality is in Chandi Dungri ridge near Chicholi, where the vein consists of quartz with varying amounts of fluorite and feldspar. The Tata Iron & Steel Co., Ltd., is working this deposit. The various methods of removing the associated minerals depend on the nature of the ore and the impurities present. For acid-making or ceramic industries, the fluorite should be practically free of all impurities and should be finely ground (100-mesh). The percentage of CaF_2 for the glass and enamel industry should be 95% with not more than 3 SiO_2, 1 $CaCO_3$, and 0.12% Fe_2O_3. For optical purposes, fluorite should be clear as glass, with no or very faint color, in 0.5- to 2-in. diameter pieces. Fluorite is used as a flux in the manufacture of alloy steels, in the extraction of aluminum metal from bauxite, and in the ceramic industry in the manufacture of opalescent glass, enamels, brick facings, and Portland cement. Fluorite is one of the essential minerals for the steel industry as well as for the newly started aluminum industry in India. M.E.P.

Foundation testing with a wagon drill. C. H. VIVIAN. *Compressed Air Mag.*, **50** [8] 206–209 (1945).—Methods of making a foundation survey on a location of unknown subsurface conditions are described. They are also applicable for a survey of clay deposits. 9 illustrations. M.B.

Improved clay sampler. A. E. C. LONGSDON. *Engineer*, **180** [4673] 97 (1945).—In the sampler described, samples are taken in the usual manner, and on recovery of the sampler the driving head and cutting shoe are removed, the ends of the sample are waxed, and two caps are screwed on to protect both ends of the sample and the threads of the tube. A tube is required for each sample taken, as the sample is left in the original tube to be conveyed to the laboratory for tests. In the laboratory the samples can be extruded either as a 4-in. diameter sample or as a number of 1.5-in. diameter samples by the use of a special multiple device. When a sufficient length of sample has been extruded for test, the rest can again be waxed and stored until further tests are required. G.A.K.

Korea: a field for capital, management, and engineers. SAMUEL H. DOLBEAR. *Eng. Mining Jour.*, **146** [7] 78–80 (1945).—Korea is rich in mineral resources; in 85,000 sq. miles there are hundreds of mineral operations employing 220,000 men. They include arsenic, barite, clay, cement, coal, diatomite, feldspar, fluorspar, graphite, gypsum, iron, lead, limestone, lithia, magnesite, petroleum, phosphate, silica, zinc, and others. 4 figures. W.D.F.

Lead-zinc flotation problem solved in grinding circuit. JOHN B. HUTTL. *Eng. Mining Jour.*, **146** [5] 94–95 (1945).—A lead-zinc ore from near Metaline Falls, Wash., has a gangue of cherty dolomite. The lead and zinc minerals are not intermixed; the lead is liberated by a coarse grind together with some of the zinc. The remainder of the zinc needs further grinding. To avoid overgrinding of the coarse minerals, rolls are in closed circuit with the screen; the undersize goes to a classifier, its overflow through a 42-mesh screen, and that passing the screen to the lead flotation. The lead rougher tailing goes to the zinc flotation. All of the lead mineral passes the 42-mesh screen; the oversize goes to a classifier in closed circuit with the zinc regrind mill and then to the zinc flotation. 1 figure. See *Ceram. Abs.*, **24** [7] 131 (1945). W.D.F.

Mineral industry of New Jersey. ANON. *Bull. Amer. Ceram. Soc.*, **24** [9] 343 (1945).

Molecular associations between montmorillonite and some polyfunctional organic liquids. W. F. BRADLEY. *Jour. Amer. Chem. Soc.*, **67** [6] 975–81 (1945).—The association of a number of polyfunctional saturated aliphatic chains with montmorillonite surfaces gives evidence of augmented attraction of the nature of a C—H · · · O

bond between methylene groups and the oxygen surfaces of the clay. The same oxygen surfaces exercise a lesser but similar influence on some aromatic rings. 9 references, 5 figures. F.G.H.

New domestic source of fluorspar in Utah. JAMES A. MARSH AND FLOYD D. EVERETT. *Eng. Mining Jour.*, **146** [6] 98–100 (1945).—The Cougar Spar mine is in Beaver County, 34 miles north of Lund. A dacite porphyry has intruded a tuff. The ore zone does not have distinct walls; it is about 35 ft. wide and averages 25% fluorite. Gangue minerals are quartz and calcite. There are many post-ore faults. The fluorspar will be mined by horizontal cut-and-fill. Metallurgical and acid grades may be made by concentration. At the mill, the ore will be sized and then jigged for metallurgical grade; flotation units may be added if acid grade is wanted. Planned production from the mine is 750 tons concentrate per month. 2 figures. W.D.F.

Pre-Cambrian iron formations. E. L. BRUCE. *Bull. Geol. Soc. Amer.*, **56** [6] 569–602 (1945).—B. discusses the origin of the ancient iron formations in the Lake Superior district, the interior of Canada, and in Brazil, India, Russia, and South Africa. Their origin is "clearly still unsettled." The formations in the southwestern part of the Lake Superior basin seem to have resulted from chemical precipitation in sea or lake waters highly charged with iron salts and silica, probably derived from igneous sources, and by the reactions of water on hot lavas. Normal geologic processes of subsequent geologic periods most probably produced all of the known iron formations. A.C.B.

Some Chinese clays as adsorbing agents. T. J. SUEN AND F. H. YAO. *Jour. Inst. Petroleum*, **31**, 179–87 (1945).—Two samples came from Nanchuan and one from Tsunyi. Mineralogically, they were respectively collyrite, cimolite, and halloysite. The collyrite was acid treated, and then the clays were tested by decolorizing oil and degumming gasoline. 3 figures. W.D.F.

Tungsten deposit near Townsville, North Carolina. WILLIAM A. WHITE. *Amer. Mineralogist*, **30**, 97–110 (1945).—The tungsten deposit near Townsville is in an area which heretofore has not been known to be mineralized. The dominant ore mineral is huebnerite, which occurs in a quartz vein containing much fluorite and sericite as well as small quantities of rhodochrosite, sulfides, and other accessory minerals. Scheelite also forms an important constituent of the ore and is believed to result from the hydrothermal alteration of huebnerite, although superficially its appearance suggests supergene origin. 9 figures. W.D.F.

SEPARATE PUBLICATIONS

Bonding Action of Clays: I, Clays in Green Molding Sands. R. E. GRIM AND F. L. CUTHBERT. *Illinois State Geol. Survey Rept. Investigations*, No. 102, 55 pp. (1945).—For more than nine years the Illinois State Geological Survey has been studying intensively the composition, molecular structure, and properties of the clay minerals which are the primary components of clays and shales. The present investigation sought to extend this work to the particular clays used in bonding molding sands with the thought that the more economical production of better castings depends largely on a better understanding of the properties of molding sands and bonding clays. The silica-sand component of molding sands has been studied extensively, but hitherto there has been little investigation of the clay. Clays are essentially aggregates of extremely small, crystalline, usually flake-shaped particles of one or more kinds of a small group of minerals known as the clay minerals. Since the properties of any clay depend largely on its clay-mineral composition, a fundamental basis for the classification of bonding clays is provided. Such a classification, founded on clay-mineral composition, is presented, together with detailed determinations of the green-strength properties that are characteristic of each class. The bonding value of one of the classes of bonding clays, i.e., halloysite, was discovered during the investigation reported here. A theory of the bonding action of clays in molding sands, based on the individual properties of the clay minerals and the rigid character of the initial adsorbed water, is presented which ascribes the bonding action of clay to a "wedge-block" at the junction of the quartz grains rather than to a gluing or adhesive effect. The characteristics peculiar to the various classes of bonding clay are explainable by this theory, e.g., the unusual air-set strength characteristics of sands bonded with kaolinite or halloysite clay. Such sands develop greatly increased strength without an accompanying water loss when they are allowed to stand in the air after ramming. The bulk-density characteristics of sands bonded with each class of clay are presented. An explanation for the variation of bulk density with amount of tempering water is suggested based on the physical character of the water adsorbed by the clay. G.A.K.

Eruptive Rocks, Their Genesis, Composition, and Classification. 2d ed. S. JAMES SHAND. John Wiley & Sons, Inc., New York, 1943. 444 pp. Price $5.00. Reviewed in *Jour. Amer. Chem. Soc.*, **66** [10] 1803 (1944). F.G.H.

Illinois Surface Clays as Bonding Clays for Molding Sands. R. M. GROGAN AND J. E. LAMAR. *Illinois State Geol. Survey Rept. Investigations*, No. 104, 41 pp.(1945).—Samples of surface clays from various parts of Illinois, including one sample of glacial till, twelve gumbotils and associated clays, one loess, three lake clays, seven residual clays, and three miscellaneous clays, were tested for green and dry compressive strength in parallel with several commercial bonding clays, including fire clays and bentonites, to determine their value as bonding clays for synthetic molding sands. The compressive strength tests were made according to procedures approved by the American Foundrymen's Assn. They involve determining the strength of a moist mixture of silica sand and the clay being tested or of a similar mixture which has been allowed to dry. The amounts of sand, clay, and moisture present are carefully proportioned. The results of the tests on sand-clay mixtures containing the natural clays, unmodified except for the removal of pebbles from pebbly samples, indicate that with 8% clay and 2% moisture, six of the samples possessed green compressive strengths equal to or greater than those of three of the nonbentonitic commercial bonding clays. The dry compressive strengths of most of the surface clays equalled or exceeded those of the nonbentonitic commercial bonding clays. The bonding ability of some clays was considerably improved by removing all the material larger than 0.002 mm. by water classification. Tests on sand-clay mixtures containing 2% moisture and 8% of the pulverized water-separated clay concentrate from three surface clays, including two lake clays and one gumbotil, showed an increase in green compressive strength of 2 to 9.5 times that of the unmodified clay. The green compressive strengths imparted by two of the clay concentrates compared favorably with green strengths given by the bentonites, 4% clay and 2% moisture being used for all tests. The dry strengths were somewhat lower than those of the bentonites. An increase in bonding ability also resulted from the removal of coarse material from a sample of gumbotil by air separation. Before air classification, the green compressive strength of this clay was less than that of any of the commercial bonding clays used for comparison. The air-separated minus 0.010-mm. fraction, however, gave a green strength greater than any of the four nonbentonitic commercial clays using 8% clay and 2% moisture for all tests. Air-separated fractions of a number of additional gumbotils and associated clays were also prepared. Most of the minus 0.010-mm. fractions, in sand-clay mixtures employing 8% clay and 2% moisture, exceeded in green compressive strength the two bentonites tested at 4% clay and 2% moisture. The dry compressive strengths imparted by 8% of these fractions approximated those given by the bentonites at 4% clay. The minus 0.050-mm. and the plus 0.050-mm. air-separated fractions generally gave lower green compressive strengths than the minus 0.010-mm. fraction at the same moisture content when 8% clay was used in sand-clay mixtures. The dry compressive strengths of

both fractions were generally similar to those produced by the bentonites at 4% clay. The green and dry compressive strengths of the samples tested are related to the relative amounts of clay-size (minus 0.002 mm.) and silt-size (0.002 mm. to 0.053 mm.) material present in the samples. In general, it was found that the more clay-size material in a surface clay the higher was its green compressive strength, and the more silt-size material in a clay the higher was its dry compressive strength. These relations may prove useful in prospecting for bonding clay even if beneficiation by removal of sand is planned, for they appear to be true of the air-separated fractions as well as of the unmodified clays. From the tests it appears that the Cretaceous clays tested, some residual clays, and possibly some lake clays would be suitable in their natural state, or after coarse screening, for ordinary foundry use. The other clays would need more or less beneficiation to compare favorably with commercial bonding clays. Some surface clays may be made to have bond strengths comparable to those of the bentonites by either hydraulic or air classification. G.A.K.

Kyanite, Andalusite, and Dumortierite in 1944. ANON. *U. S. Bur. Mines Rept.*, **MMS 1298**, 2 pp. (1945). Free. R.A.H.

Minerals Yearbook, 1943. U. S. BUREAU OF MINES. 1626 pp., 111 figs. Price $2.50 from Supt. of Documents, Govt. Printing Office, Washington, D. C.—The nation's most comprehensive and authoritative publication on the production, distribution, and consumption of mineral commodities, hitherto classified confidential, is now available. R.A.H.

Chemistry and Physics

Bibliography of electron microscopy: II, III. CLAIR MARTON AND SAMUEL SASS. *Jour. Applied Phys.*, **15** [8] 575-79 (1944); **16** [7] 373–78 (1945); for Part I see *Ceram. Abs.*, **23** [10] 173 (1944). A.P.

Colorimetric determination of nickel with dimethylglyoxime. A. M. MITCHELL WITH M. G. MELLON. *Ind. Eng. Chem., Anal. Ed.*, **17** [6] 380–82 (1945).—A spectrophotometric study was made of the colorimetric method involving formation of a soluble red complex by treating nickelic ion in ammoniacal solution with dimethylglyoxime. Beer's law applies for concentrations from 0.1 to 5 p.p.m. of nickel, using 1.000-cm. absorption cells. The aqueous system is unstable, but sufficient ethanol makes the color stable for 30 min. Of the ions soluble under the conditions used, only auric, cobaltous, and dichromate interfere seriously. Metals which precipitate in ammoniacal solution are removed in the procedure, unless it is possible to prevent precipitation through some suitable reaction. 16 references, 4 figures. F.G.H.

Crystallized basic zinc chromates. O. F. TARR, MARC DARRIN, AND L. G. TUBBS. *Jour. Amer. Chem. Soc.*, **66** [6] 929–30 (1944).—By the preparation of new well-defined crystals of a series of basic zinc chromates in which the oxides are combined in simple molecular proportions, it is shown that some of these products are definite chemical compounds, verifying the belief of the majority of prior investigators. 5 references, 1 figure. F.G.H.

Effects of some oxide additions on the thermal-length changes of zirconia. R. F. GELLER AND PAUL YAVORSKY. *Jour. Research Nat. Bur. Standards*, **35** [1] 87–110 (1945); RP 1662. Price 10¢ from Supt. of Documents, Washington, D. C.—The oxides of cerium, yttrium, silicon, magnesium, and calcium were added in various proportions to zirconia of 99% purity, and the effects of these additions, combined with preheating at various temperatures ranging from 1450° to 1950°C., on thermal length changes of the zirconia during heating and cooling between room temperature and a maximum of 1700°C. were observed. The results are compared with similar observations on zirconia of 96, 98, and 99% purity without oxide additions. The results show that the irregular thermal length changes accompanying phase transformations in zirconia may be prevented by changing the crystal to the stable cubic form. This was accomplished by (*a*) 11.5 and 15% additions of Y_2O_3 and heating at 1700°C. or higher; (*b*) 8 and 15% additions of MgO and heating at 1550°C. or higher, but only for the range from room temperature to 1200°C.; and (*c*) 5, 6, 8, and 15% additions of CaO and heating at 1550°C. or higher, but additions of more than 6% caused the specimens to be very porous and proportionately weak. In all cases, however, the expansion during heating and contraction during cooling were relatively high. The coefficients of linear thermal expansion of the specimens that were all or nearly all cubic ranged from 8.8 to 11.8 $\times 10^{-6}$. Furthermore, zirconia has a low thermal conductivity relative to such materials of high thermal expansion as alumina, magnesia, and beryllia (unpublished). Consequently, a high resistance to thermal shock cannot be expected of the stabilized product, even though it is not subject to the structural disintegration characteristic of the commercially pure materials. R.A.H.

Electrical conductivity of molten blast-furnace slag. A. E. MARTIN AND GERHARD DERGE. *Amer. Inst. Mining Met. Engrs. Tech. Pub.*, No. 1569; *Metals Tech.*, **10** [5] 11 pp. (1943).—To investigate blast furnace slag ionization, synthetic slags were made in the $CaO–Al_2O_3–SiO_2$ system, and a graphite crucible and electrodes were used. The peak of electrical conductivity was found to be at the composition CaO 47, Al_2O_3 11, and SiO_2 42%. This is close to a ternary eutectic. A minimum conductivity was found at CaO 37, Al_2O_3 17, and SiO_2 46%. Conclusions are as follows: (1) Modern blast-furnace slags have high electrical conductivity and a high positive temperature coefficient of conductivity, which indicates high degrees of ionization. (2) At a given temperature, electrical conductivity in the $CaO–Al_2O_3–SiO_2$ system is somewhat related to viscosity, the former increasing and the latter decreasing with increasing basicity. This probably means, in the more basic slags, that either ionization is higher or the ions are smaller and therefore more mobile. (3) Silicon migrates with the negatively charged groups during electrolysis, and calcium, with the positively charged groups. (4) A theory of slag constitution based on the results of this research and modern knowledge of glasses assumes that, as the atomic ratio of oxygen to silicon in a slag increases, the number of small silicate ions of the type $(SiO_4)^{-4}$ and $(Si_2O_7)^{-6}$ will increase and that constituents such as CaO, FeO, and ferrites become stable in basic slags, because it is only under these conditions that unsaturated silicate complexes will not tend to attract all available oxygen ions. W.D.F.

Fast grating spectrograph. Accessories and techniques for studying the Raman effect. ROBERT F. STAMM. *Ind. Eng. Chem., Anal. Ed.*, **17** [5] 318–31 (1945).—S. outlines the design and construction of a fast, high-resolution, moderate-dispersion grating spectrograph suitable for use in an industrial laboratory. The experimental techniques found satisfactory for the obtaining of Raman spectra in a routine manner are described along with the special appurtenances necessary for such work. Many structural problems which are soluble by the special methods of Raman spectroscopy arise in the chemical industry. For those not acquainted with the method, an elementary discussion on the elucidation of molecular structure has been included. This has necessitated the inclusion of a short description of an experimental method used in obtaining depolarization values of Raman lines. The subjects of qualitative and quantitative analysis by Raman effect are discussed, and practical examples are given to show results obtainable. 15 references, 17 figures. F.G.H.

Formation of surface layers. D. D'EUSTACHIO AND S. B. BRODY. *Jour. Optical Soc. Amer.*, **35** [8] 544–51 (1945).—Successive views in a series of back reflection X-ray powder pictures of freshly crushed coarse crystalline material exhibit a progressive change. Individual spots

sharpen, diffuse portions of powder rings disappear, and the number of spots increases markedly with time. The increase in spots is not caused by breaking of the particles. Experiments with calcite, topaz, quartz, barite, and anhydrite indicate that the changes are associated with the surface. The time rate of change increases with the hardness of the material and appears to be related to the degree of valence binding in the structure. As a tentative explanation, it is suggested that whenever fracture occurs, part of the energy used to break the crystal remains on the surface in the form of structure irregularity. A thin, highly stressed, possibly glassy, surface layer results. Since such a state is not stable, the atoms that most nearly occupy positions on the lattice of the mother crystal have less tendency to migrate than those that are badly displaced. As a result, certain atoms or groups of atoms will act as nuclei for growth of surface "crystallites." The orientation of each little block of crystal will be a compromise between the position of the nucleus and that of the mother crystal. Final linear dimensions of the crystallites may be about 50 to 100 times the unit cell translation. 7 figures. A.P.

Gas adsorption methods for measuring surface area of adsorbents. PAUL H. EMMETT. *Ind. Eng. Chem.*, **37** [7] 639–44 (1945).—Published proposals for measuring surface areas by gas adsorption are critically discussed. It is concluded that the use of low-temperature adsorption of some gas, such as nitrogen, near its boiling point is the best substantiated procedure thus far described and that this procedure is capable of yielding reliable values for the surface areas of porous and finely divided materials or even of materials which have relatively small surface areas. 24 references, 4 figures. F.G.H.

Heat of formation of aluminum oxide. PAUL E. SNYDER AND HARRY SELTZ. *Jour. Amer. Chem. Soc.*, **67** [4] 683–85 (1945).—The heat of formation of aluminum oxide under standard conditions was found to be $-399.0_4 \pm 0.24$ kcal. The solid Al_2O_3 obtained was the α, or corundum, form. The methods and practices in use at the National Bureau of Standards were used throughout. 18 references. F.G.H.

High-temperature heat contents of aluminum oxide, aluminum sulfate, potassium sulfate, ammonium sulfate, and ammonium bisulfate. C. HOWARD SHOMATE AND B. F. NAYLOR. *Jour. Amer. Chem. Soc.*, **67** [1] 72–75 (1945).—The industrial production of alumina from clays and alunite dictated the study of the thermodynamic properties of the compounds noted. The high-temperature heat contents, above 298.16°K., of aluminum oxide (sapphire), anhydrous aluminum sulfate, potassium sulfate, ammonium sulfate, and ammonium bisulfate were determined from about 473°K. to temperatures between 623 and 1773°K., depending on the thermal stability of the substance. The heats of fusion of potassium sulfate and ammonium bisulfate and the heat of the transition in potassium sulfate were obtained from these data. Heat-content and specific-heat equations, adequately representing the experimental data, are derived for each substance. The data are summarized by giving the heat, entropy, and free energy increments above 298.16°K. at even temperature intervals. 15 references, 1 figure. F.G.H.

High-temperature heat contents of sodium metasilicate and sodium disilicate. B. F. NAYLOR. *Jour. Amer. Chem. Soc.*, **67** [3] 466–67 (1945).—High-temperature heat contents above 298.16°K. of sodium metasilicate and sodium disilicate were determined from room temperature to about 1773°K. The heat of fusion of the metasilicate also was obtained, but glass formation precluded a heat of fusion determination for the disilicate. The results are summarized by algebraic equations and a table giving heat content and entropy increments above 298.16°K. at 100° intervals. 7 references, 1 figure. F.G.H.

Interpretation of clay analyses. D. A. HOLDRIDGE AND MARCUS FRANCIS. *Trans. Brit. Ceram. Soc.*, **44** [3] 31–37 (1945).—It has been shown that there are a number of points which are left obscure when predictions of clay properties are made from the data derived from chemical analyses. From this point alone it is clear that the extra information to be derived from the study of base-exchange phenomena would be of real value in helping to throw light on the more obscure points. A base-exchange method in most cases seems to give more accurate figures for the amounts of calcium and magnesium than the ultimate analysis. R.A.H.

Lithium—extraction, recovery, and industrial uses. A. G. AREND. *Ind. Chemist*, **20** [235] 423–26 (1944). D.G.P.

Melting point of alpha-alumina. R. F. GELLER AND P. J. YAVORSKY. *Jour. Research Nat. Bur. Standards*, **34** [4] 395–401 (1945); RP 1649. Price 5¢ from Supt. of Documents, Washington, D. C.—Results are given of seven melting-point determinations on alpha-alumina of high purity in an oxidizing atmosphere and under atmospheric pressure. There was detectable contamination of the specimens by vapors of other elements in the furnace atmosphere, but the results are believed to show that the melting point of alpha-alumina is within the range 2000° to 2030°C. R.A.H.

Potentiometric titration of small amounts of boron—null point method. A. E. RUEHLE AND D. A. SHOCK. *Ind. Eng. Chem., Anal. Ed.*, **17** [7] 453–54 (1945).—A rapid direct-titration method for determining boron in low concentrations which has been applied to magnesium chloride solutions and various other samples, is described. The potentiometric apparatus is simple and inexpensive. 9 references, 1 figure. F.G.H.

X-ray topographs. N. WOOSTER AND W. A. WOOSTER. *Nature*, **155** [3948] 786–87 (1945).—Where a sizable crystal is to be used for investigations of structure-sensitive properties, it is advisable to test its homogeneity. This may be done in the following way. The crystal is irradiated by a wide beam of appropriately filtered X rays, diverging from a pinhole placed close to the anticathode. A small piece of flat photographic film is mounted in a holder on the axis about which the crystal oscillates. The film is arranged parallel to the face of the crystal to be examined. The crystal is then placed in the position for a Bragg reflection to occur for this face, and the crystal and film are then oscillated through an angle sufficient for every part of the crystal to reflect. With this arrangement, an almost undistorted topograph of the surface of the crystal may be obtained with copper radiation. G.A.K.

SEPARATE PUBLICATION

Equilibrium in the Reduction of Ferrous Chromite by Hydrogen and Energy Requirements in the Selective Reduction of Iron in Chromite. F. S. BOERICKE AND W. M. BANGERT. *U. S. Bur. Mines Rept. Investigations*, **3813**, 19 pp. (1945). Free.—The authors deal with the preparation of substantially pure ferrous chromite, the apparatus and method for studying equilibria in the selective hydrogen reduction reaction, the derivation of the heat and free energy of formation of ferrous chromite from the equilibrium data, and some applications of the thermodynamic values to selective reduction of chromite by other reducing agents, particularly solid carbon and methane. R.A.H.

PATENTS

Manufacture of strontium oxide. J. B. PIERCE, JR.; First National Bank of Tampa, executor. U. S. 2,382,909, Aug. 14, 1945 (June 10, 1942). 1 claim. Cl. 23-186.—The method of making strontium oxide which comprises confining a charge consisting of substantially equimolecular weights of free carbon and strontium carbonate in a substantially closed chamber and therein subjecting it to the heat of an electric arc of an intensity sufficient to heat the charge to a calcining temperature, not less than 1100°C., while continually maintaining over the charge, during the firing thereof, an envelope of nascent carbon monoxide at substantially atmospheric pressure and substantially free from carbon dioxide and while constantly oscillating the chamber to and fro through a very large portion but by no means a complete revolution.

General

Air conditioning a porcelain enamel department. ANON. *Enamelist*, **22** [6] 9–11 (1945).—The provision of water-cooled air at the brushing tables and conveyer chain of the Roesch Enamel Range Co. reduced working fatigue and sweat marks on the ware. V.D.F.

Americans reported indifferent to export opportunities. NELSON G. PHELPS. *Ceram. Ind.*, **45** [2] 42–43 (1945).—After eleven months' travel through the Middle East, Phelps, Industrial Specialist to the American Economic Mission, gives his views on opportunities awaiting American china and glassware industries in the Middle East. H.T.

Automatic chemical doser. ANON. *Ind. Chemist*, **21** [241] 61 (1945).—United Filters and Engineering, Ltd., has developed the Flexiflo chemical doser, which is operated by water pressure and is a diaphragm-controlling element connected across a venturi tube or orifice plate fitted in the main at the point where treatment is desired. 5 figures. D.G.P.

Boiler house instruments and automatic control. A. L. HANCOCK. Third lecture in the series on fuel economy in the chemical industry, organized by the Assn. of British Chemical Manufacturers; abstracted in *Ind. Chemist*, **21** [245] 319–22 (1945). D.G.P.

Ceramic Educational Council—Report of Committee on Ceramic Curricula and Course Content. C. R. AMBERG, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [9] 336–38 (1945). **Report of Committee on Physical Chemistry.** A. E. BADGER, Chairman. *Ibid.*, p. 338.

Ceramic industry and the returned serviceman. ARTHUR J. BLUME. *Bull. Amer. Ceram. Soc.*, **24** [9] 320–22 (1945).

Ceramics. F. SINGER. *Jour. Can. Ceram. Soc.*, **14**, 27–29 (1945); see *Ceram. Abs.*, **24** [3] 65 (1945). G.A.K.

Ceramics today. H. G. FISK. *Design*, **45** [8] 21 (1944).—Before the war took metals out of circulation, ceramic raw materials were involved in 70% of all industrial chemistry operations; they were fundamental in the processing of most metals and an integral part of such sciences as radio and electrical engineering. Due to the metal shortage, ceramics is becoming more important than at any time since the advent of the metal age. L.S.

Clay and shale grinding problems. L. A. HENDERSON. *Jour. Can. Ceram. Soc.*, **14**, 13 (1945).—The relative merits of dry pan, grinder, and roll crusher for different types of clay and shale are discussed. G.A.K.

Conference on the utilization of steam, heat, and power. ANON. Report of meeting at the Institution of Civil Engineers, May, 1943; *Inst. Fuel War Time Bull.* (loose paper in *Jour. Inst. Fuel*, **16** [90] (1943)), pp. 20–24.—Brief reports and suggestions of fuel efficiency committees are presented, including the regional organization of the fuel efficiency campaign, progress of the work of the industry fuel efficiency committees, fuel efficiency in individual factories, methods adopted by the industry to promote the efficient use of fuel, the selection of refractories and the use of insulating materials in relation to fuel economy, and the construction of a heat balance without instruments. In the glass industry, the following economies are mentioned: the application of insulation to glass furnaces, particularly to the superstructure; a modification in the design and setting of gas burners for fire polishing; the more frequent ashing of static producers; more careful supervision of the use of electricity on lehrs; and the stoppage of air leakage and the reduction of excess air on boiler installations. D.G.P.

Consumer credit potential in postwar distribution. R. H. STOUT. *Bull. Amer. Ceram. Soc.*, **24** [9] 326–28 (1945).

Allen Percival Green. ANON. *Bull. Amer. Ceram. Soc.*, **24** [9] 317–19 (1945).—1 photo.

History and development of single bucket mechanical excavators. T. N. F. SMITH. *Claycraft*, **18** [9] 362–66 (1945).—S. describes the methods used and the gradual development of mechanical means for lifting and earth moving, with special attention to the single bucket mechanical excavator. G.A.K.

Lime-soda water softening: a description of the Accelator Plant. F. J. R. TAYLOR AND C. K. BRANTHWAITE. *Ind. Chemist*, **20** [228] 10–13 (1944).—A description of the Accelator sludge recirculation water softener is given. The softening reaction takes place in the presence of seed crystals in the form of slurry in which calcium carbonate is present, so that the reagents need not be mixed before being added to the water. The whole softening process is carried almost to completion in 5 min. Economies are a saving in chemicals and less filter washing. 1 figure. D.G.P.

Mechanical draft applied to steam boiler plants (discussion). H. BRISTOW ET AL. *Inst. Fuel War Time Bull.*, **1944**, April, pp. 134–36.—In many instances the change from natural to mechanical draft has resulted in an increase in evaporation of between 15 and 20% for the same fuel consumption. Types of fans and their operation are discussed. 1 figure. D.G.P.

New molding process for gray iron castings. K. GRUNKE. *Giesserei*, **31**, 126–28 (Aug., 1944); abstracted in *Bull. Iron & Steel Inst.*, **1945**, No. 109, p. 75; *Bull. Brit. Cast Iron Research Assn.*, **7** [12] 253 (1945).—The Gödel cement-sand molding process is briefly described; a cement sand is used as pattern sand, and the remainder of the mold is filled up with silver sand. No hand or pneumatic ramming is necessary. Two examples of large castings molded in this way are described and illustrated. M.HA.

Outstanding developments in ceramic industry and technology for 1944. G. A. KIRKENDALE. *Jour. Can. Ceram. Soc.*, **14**, 5–12 (1945).—K. reviews the more notable ceramic developments of 1944 under the following headings: (1) refractories, (2) glass, (3) structural clay products, (4) whiteware, (5) vitreous enamel, and (6) miscellaneous. G.A.K.

Superheaters for water-tube boilers. L. C. SOUTHCOTT AND D. W. RUDORFF. *Inst. Fuel War Time Bull.*, **1944**, Oct., pp. 1–15. 100 references, 27 figures. **Discussion.** *Ibid.*, **1945**, Feb., pp. 130–32. D.G.P.

Tests for the detection and analysis of color-blindness: I, The Ishihara test—an evaluation. L. H. HARDY, GERTRUDE RAND, AND M. C. RITTLER. *Jour. Optical Soc. Amer.*, **35** [4] 268–75 (1945).—The Ishihara test for color-blindness fails to give more than a superficial evaluation of the state of an observer's color vision. **III, The Rabkin test.** *Ibid.*, [7] 481–91.—Rabkin's Polychromatic Plates for testing color vision are found to be more valuable and informative than the Ishihara plates. A.P.

Two new crusher jaw developments. ANON. *Claycraft*, **18** [9] 384–88 (1945).—Two developments described are (1) a special form of jaw face designed for use in jaw granulators or secondary crushers and (2) a method of overcoming uneven wear of the crushing faces in jaw granulators and breakers. G.A.K.

Urology—some industrial and compensation aspects. A. J. GREENBERGER AND M. E. GREENBERGER. *Ind. Med.*, **11**, 123–27 (March, 1942).—Various phases of urology in relation to compensation cases are discussed. Thorough examination and history taking have in many cases demonstrated nonoccupational causes, often infection, for injuries believed by the patient to be of occupational origin. F.S.M.

What do you think of research? G. H. MCINTYRE. *Enamelist*, **22** [9] 11–13, 46 (1945).—The place of research in relation to industry is discussed in the light of recent expressions of opinion on the subject by leaders in the field. V.D.F.

SEPARATE PUBLICATIONS

Engineer's Dictionary—Spanish-English and English-Spanish. LOUIS A. ROBB. John Wiley & Sons, Inc., New York, 1944. 423 pp. Price $6.00. Reviewed in *Power*, **88** [7] 490*c* (1944). F.G.H.

Preliminary Data on Methods for Controlling the Dust Hazards in Mechanical Mining. C. W. OWINGS. *U. S. Bur. Mines Information Circ.*, **7151** (March, 1941).—O. deals specifically with dust control in mechanical mining in the bituminous coal mines of the U. S. The hazard of coal dust, dust in conveyer mining, dust during loading with mobile units, haulage, rubber-tired buggies, watering methods, and wetting agents, as a means of overcoming the use of excessive quantities of water, are discussed.

F.S.M.

PATENTS

Heat insulating mass. EDOARDO SCHEIDLER. Ital. 386,591, Feb. 29, 1940; abstracted in *Chem. Zentr.*, **1943, I** [20] 2130.—The mass consists of a mixture of 1000 gm. fly ash, 2.5 gm. Na_2SiF_6 powder, and 1000 gm. Na_2SiO_3 solution of 21° Bé. or of 1000 gm. fly ash, 125 gm. $CaCO_3$ powder, 125 gm. Na_2SiF_6 powder, and 1250 gm. Na_2SiO_3 solution of 21° Bé. M.HA.

Method of binding ceramic bodies. F. SINGER AND F. BEKEN. Brit. 570,345, July 18, 1945 (Oct. 7, 1943).

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United States Public Health Reports
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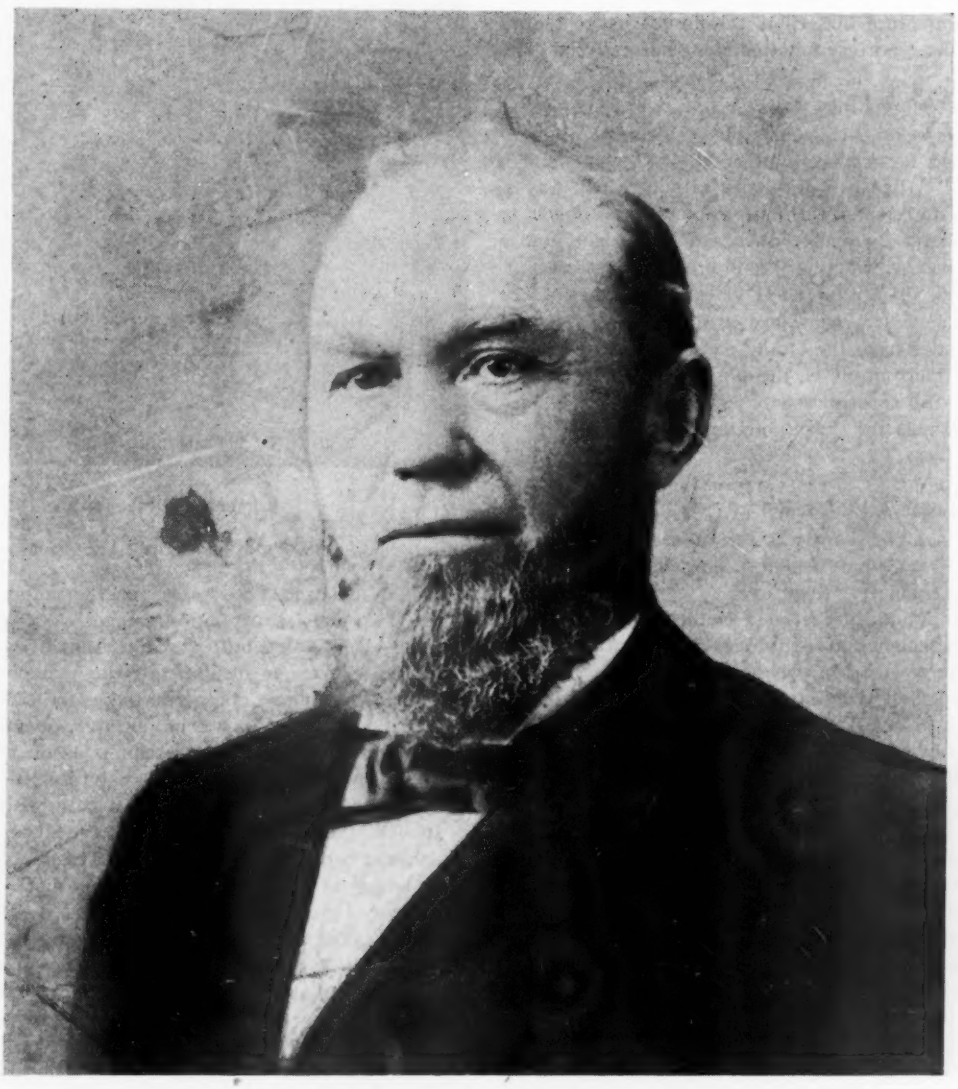
THE BULLETIN SECTION

Volume 24 October 15, 1945 **Number 10**



DAVID H. HAEGER

HISTORY OF THE HAEGER POTTERIES, INC.

In 1871, David H. Haeger arrived in Dundee, Illinois, to look about for a business that seemed to have a future. Shortly thereafter, he purchased an interest in the Dundee Brick Yard, which was making a fine sand-mold brick. The brick made there can still be seen in many of the large and prominent factories and homes of northern Illinois and southern Wisconsin.

He later added two other brick and tile factories which earned for him a comfortable fortune.

In 1900, Mr. Haeger passed away, and the management of the factories fell upon his sons. The building-material business was continued until 1912, when the company began to manufacture flowerpots for florists. The manufacture of glazed pottery followed along naturally in 1914.

Launching of Artware Line

A few days before the opening of World War I, the pottery launched its artware efforts with a designer and a moldmaker. A line was developed rapidly which was of interest to stores, and the first shipment was made to Marshall Field & Company of Chicago. Their acceptance of this new line helped greatly to interest other stores.

On July 16, 1919, Edmund H. Haeger, a member of The American Ceramic Society since 1916, purchased the pottery at Dundee from the family corporation and became president. The output of the pottery was immediately doubled by the construction of another kiln. Salesmen were added, and the output gradually increased as the years went by.

Employment of F. J. M. Koenig

In 1924, the company was fortunate in securing the services of Franz Josef Menko Koenig as superintendent and ceramic engineer.

Mr. Koenig, born in Vreeland, Netherlands, August 14, 1882, finished high school in Vreeland and attended the Art Institute of Haarlem, where he received his diploma; three and one-half years later he was graduated from the Ceramic School of Höhr-Grenshausen, Germany. He was then for seven years assistant manager of the Delft Corporation, Hilversum, Netherlands. He owned his own pottery from 1912 to 1916.

In 1916, Mr. Koenig went to the Taastrup Faience factory in Copenhagen, Denmark, and later became assistant manager of a dinnerware factory in Wilhelmsburg near Vienna, Austria.

In 1918, the Bureau of Industries of the Netherlands sent him as ceramic consultant to Java, Dutch East Indies. To travel to Java, he had to go by way of America and Japan because of the first World War. Immediately after finishing his contract with the Netherlands Government, he returned to America to enter the employ of The Haeger Potteries.

Mr. Koenig, a member of The American Ceramic Society since 1923, has become one of the foremost art pottery men in the United States, and his development of new glazes and colors has played an important part in the success of the business.

Edmund H. Haeger

Exhibit at Century of Progress

In 1934, Haeger Potteries occupied an important space at the Century of Progress in Chicago. A separate building housed a complete pottery plant. Indians were brought from New Mexico to demonstrate the handmade pottery, hand throwers made up special pieces for visitors, and a regular line of souvenirs was produced in the plant proper. About forty-two persons were employed during 1934 up until December 1. This exhibit was visited by more than four million persons and was of great advertising value.

In 1938, the pottery introduced a new, highly styled line which was known as Royal Haeger. The items in this line were largely of very modern design and met with prompt acceptance by the trade.

In 1939, The Haeger Potteries, Inc., took over a pottery at Macomb, Illinois, which for many years had made a superior line of stoneware. With the growing demand for artware, it was necessary in 1941 to convert this plant into an art pottery exclusively.

In 1941, a second tunnel kiln was built at Dundee to take care of the market demand for pottery and pottery lamp bases. During the peak of this demand, the pottery made four thousand lamps a day in addition to its artware. A subsidiary company marketed an outstanding line of lamps and shades.

Sales have continued to climb as a result of having offices

in New York, Chicago, Los Angeles, Portland, and Seattle. Salesmen cover the entire United States, and their customers include practically all of the larger stores. Plans are now under way to double the output at the Macomb pottery; a new kiln is being built.

The Working Force

J. F. Estes, before his enlistment in the Army Air Corps, was general manager and will later resume that position. The company is fortunate in having many experienced workmen who have come up through the ranks and who play such an important part in production. The normal working force of the company is 350 employees, whose welfare has the constant thought of the management. Mr. Haeger recently purchased a six-hundred-acre estate, part of which will be used for employees' recreational activities.

RECENT DEVELOPMENTS IN GRINDING CERAMIC MATERIALS IN PEBBLE, BALL, AND TUBE MILLS*

By G. F. Metz

Abstract

Grinding liners and balls, flint, Jasper adamant, zircon, and porcelain, are compared for life and efficiency. The problems of grinding hard and fibrous materials are discussed. Mixing of fine powders and grinding to desired screen-size proportions of granular fines and moist materials are described. The importance of grinding in flotation separation is stressed, and the type of mill is given. Auxiliary equipment, such as control of feed by the Electric Ear, is considered in detail.

I. Introduction

Since an earlier paper by the writer,[1] many new developments and improvements in the art of processing ceramic materials have taken place. The principles of operation of the various mills, however, remain the same, as these principles are basic.

II. Grinding Liners and Balls

(1) Jasper Adamant

Before the war, mainly Danish or French flint pebbles and Belgian silex lining blocks were used in pebble mills, but as this source was cut off and local stocks were exhausted, other sources of grinding media were sought. Silica blocks and cubes quarried by the Jasper Stone Company, Jasper, Minnesota, have been found to equal in service the Belgian silex and imported pebbles. This stone is comprised of 94% silica, from 0.7 to 1.6% iron oxide, and potash, alumina, and lime.

Pebbles from Newfoundland, North Carolina, Texas, and other localities in the United States are being used, but the Jasper adamant silica grinding media and lining give the best results.

(2) Zircon

The Locke Insulator Corporation is manufacturing a zircon ball which has a specific gravity of 3.7 (considerably higher than that of adamant silica cubes, flint pebbles, or porcelain). A 6-foot by 36-inch conical pebble mill, equipped with an air classifier and charged with 5200 pounds of 2- and 1 1/4-inch zircon balls, is grinding zircon sand to 98 1/2% −400-mesh. The mill capacity has been materially increased by the use of zircon balls.

Zircon balls cost between 25 and 65 cents per pound,

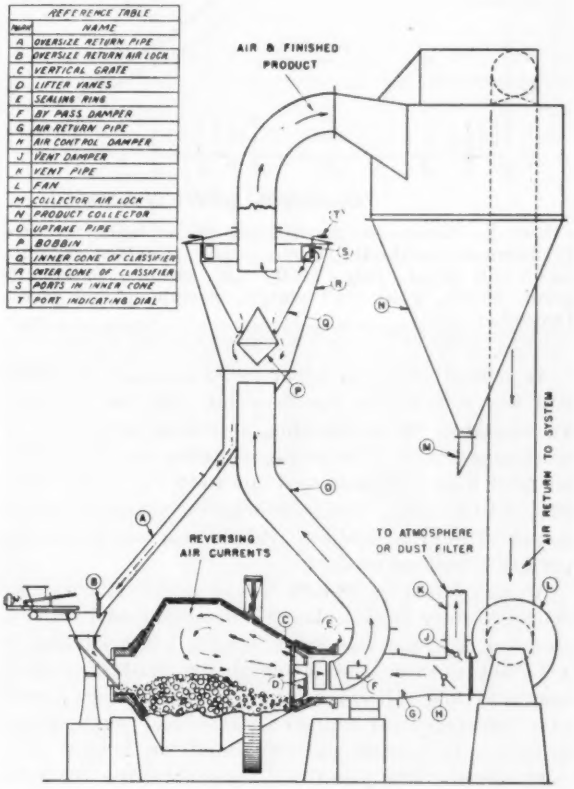


FIG. 1.—General arrangement of mill and superfine air classifier.

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* Forty-Seventh Annual Program, The American Ceramic Society, Inc., 1945 (Materials and Equipment Division, No. 13); presented at the Baltimore-Washington Local Section Meeting, June 2, 1945. Received April 13, 1945.

[1] G. F. Metz, "Grinding Ceramic Materials in Ball, Pebble, Rod, and Tube Mills," *Bull. Amer. Ceram. Soc.*, **16** [12] 461–67 (1937).

depending on their size. If this cost can be decreased to slightly above that of porcelain, zircon balls will have a wide use. By using the heavy zircon balls rather than steel balls, many industries will be considerably benefited by the elimination of metallic contamination and lower cost of grinding equipment.

III. Fine Grinding

Continuous fine grinding to micron sizes is possible with wet- or dry-grinding pebble mills.

At one plant, an 8-foot by 48-inch conical pebble mill equipped with a superfine air classifier (Fig. 1) is dry-grinding nepheline syenite from a 20-mesh feed size to 95% −325-mesh at the rate of 2500 pounds per hour on a total of 65 h.p.; 64% of the product passes 20 microns, 42% passes 10 microns, and 15% passes 2 microns. Continuous-mill and former batch-mill-ground products are compared in Fig. 2.

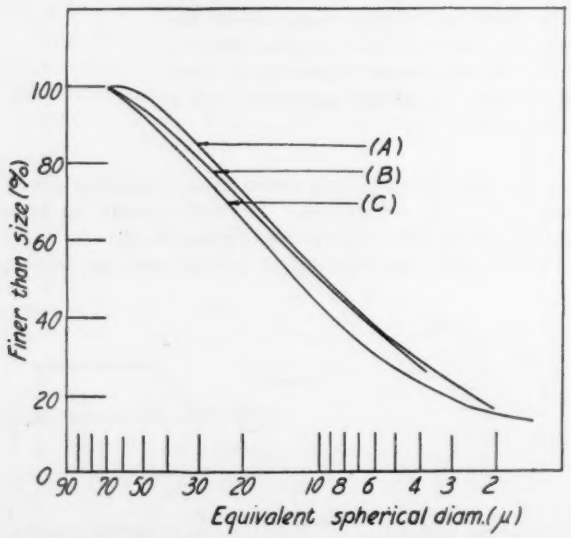


FIG. 2.—Grain-size distribution of nepheline syenite (hydrometer method). *Curves:* (*A*) standard sample, batch-mill grind, July, 1939; (*B*) sample, batch-mill grind, March, 1940; (*C*) sample, continuous-mill grind, December, 1940.

At another plant, an 8-foot by 48-inch conical pebble mill was installed in closed circuit with two separate air separators for dry-grinding aluminum oxide used in spark-plug bodies. The average capacity was 500 pounds per hour from a 14-mesh feed size to 99.7% −325-mesh, 52% −10 microns. The pebble charge consisted of 10,000 pounds of Bolivian pebbles. Pebble wear was 26 pounds per ton of finished product.

Another 8-foot by 48-inch conical pebble mill was installed recently in this plant. It was equipped with an air-swept superfine classifying system, which eliminated a bucket elevator and delivered the finished product from a cyclone collector to storage. Preliminary results gave 350 pounds per hour on a 9500-pound pebble charge to 68% −10 microns and 600 pounds per hour at 53% −10 microns; 99% passed a 325-mesh screen. The mills were lined with adamant silica blocks.

At another plant, a 7-foot by 36-inch conical mill, using steel balls, is wet-grinding an aluminum oxide spark-plug body from a $-5/16$-inch feed to 90% −10 microns at the rate of 1500 pounds per hour on 135 h.p.; the mill is operated in closed circuit with a hydroclassifier (Fig. 3).

When closed-circuit fine grinding is to be done, the material should be fed to the mill in as fine a crushed condition as possible. This allows the use of smaller balls and provides more surface contact.

Experiments are now being conducted on a pilot-plant scale at a sanitary-ware pottery with the aim of making the entire slip preparation continuous. Crushed and fine raw materials will be stored in separate bins. Weighing feeders will remove the materials in definite proportions and deliver them to a gathering conveyer, which will discharge at a uniform rate into a wet-grinding and mixing conical pebble mill instead of into the usual blungers. Light foreign matter, such as lignite or other floating matter, will be removed on a conical screen attached to the discharge end of the mill. The resulting slip will be pumped to storage tanks equipped with agitators. From these tanks, the slip will be pumped to filter presses or possibly to a continuous vacuum filter for dewatering.

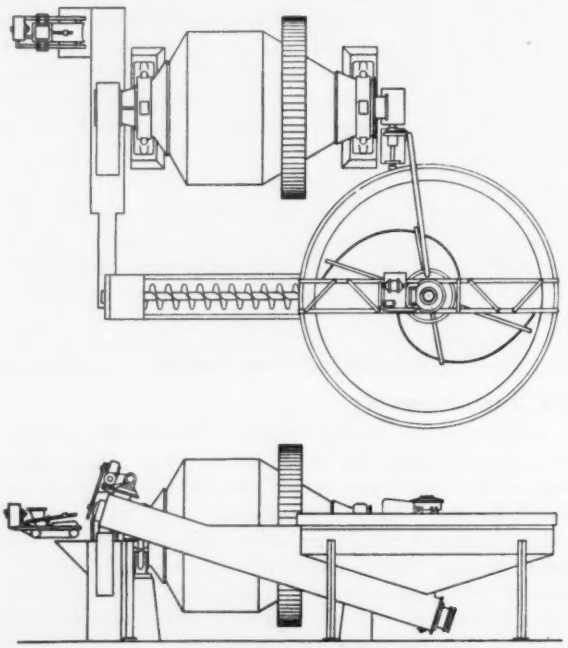


FIG. 3.—Mill in closed circuit with hydroclassifier.

IV. Grinding Fibrous Materials

In the dry-grinding of certain fibrous materials, such as talc rock, it is difficult to separate to a superfine product with an air-swept pebble mill. On such materials, it is preferable to use a separate air separator and operate the mill as a gravity discharge, elevating the mill product by pneumatic conveyer or bucket elevator to the separator. With an air-swept mill, fine long fibers are removed before they are thoroughly ground, as they have a tendency to go through the air classifier into the finished product. A relatively coarse vibrating screen usually removes fibers which are not taken out in the separator.

V. Mixing Fine Powders

When two or more products are to be ground to a fine dry product and thoroughly mixed in predetermined proportions, a continuous-grinding pebble-tube mill in open circuit usually is used. At one plant, an 8- by 20-foot tube mill is dry-grinding cullet, to which is added a small amount of a much lighter material. Closed-circuit grinding with an air separator at first caused segregation of the materials. Open-circuit grinding, even though the capacity was materially reduced, solved the problem. The feed is approximately all $-{}^{3}/_{16}$-inch and the product is all −150-mesh. The capacity is 1200 to 1500 pounds per hour on 150 h.p. The mill is lined with adamant silica and charged with 3- and 2-inch porcelain balls.

Batch pebble mills have been used for dry-grinding enamel frit. The first continuous-grinding equipment was installed at the American Radiator & Standard Sanitary Corporation's plant in Pittsburgh about twenty-three years ago. It consisted of an 8-foot-diameter by 30-inch cylinder conical pebble mill, to the discharge end of which was attached a conical screen (Fig. 4) equipped with a 55-mesh screen. Grinding was in open circuit and the small

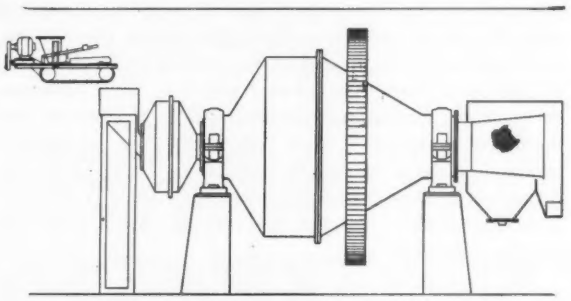


FIG. 4.—Conical mill with discharge screen.

amount of reject on the screen was discarded or remelted. This was a great improvement over batch milling because it reduced power and labor costs. During the years following this installation, a great many manufacturers of sanitary ware installed conical mills. Later, separate vibrating screens proved to be more efficient than the conical screen and many conical screens were replaced with separate vibrating screens. With the advent of air classification in conjunction with conical mills, several installations of this type have been made in the past few years.

Ordinarily, in frit grinding, a product is desired in which all will pass 50-mesh, with 65 to 70% passing 200-mesh. The loop air-classifying system (Fig. 5) was developed for this, and at one plant there are now two 7-foot by 36-inch conical pebble mills equipped with these classifiers, each dry-grinding frit at the rate of 1100 to 1200 pounds per hour on about 40 h.p. (Fig. 6). Air-swept separation increases capacity and eliminates dust and bucket elevators. The product is delivered direct by air to storage or suitable receptacles.

At the Ferro Enamel Corporation, two 6-foot by 36-inch conical mills equipped with superfine air classifiers (Fig. 1) are dry-grinding a glaze frit to 99% −325-mesh. Adamant silica lining blocks and grinding cubes are used.

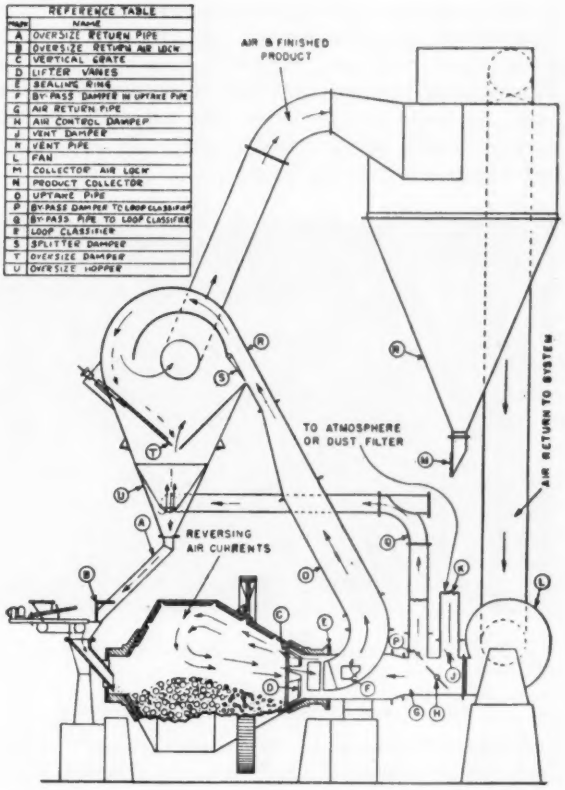


FIG. 5.—General arrangement of mill and loop classifier.

At another plant making sanitary pottery, a conical mill with a separate air classifier grinds about 1500 pounds per hour of $^{3}/_{16}$-inch crushed pottery rejects to −150-mesh. The grinding media and lining are Jasper adamant silica.

VI. Granular Fines

For the production of granular fines, vibrating screens with air classifiers can be used to advantage. The mill

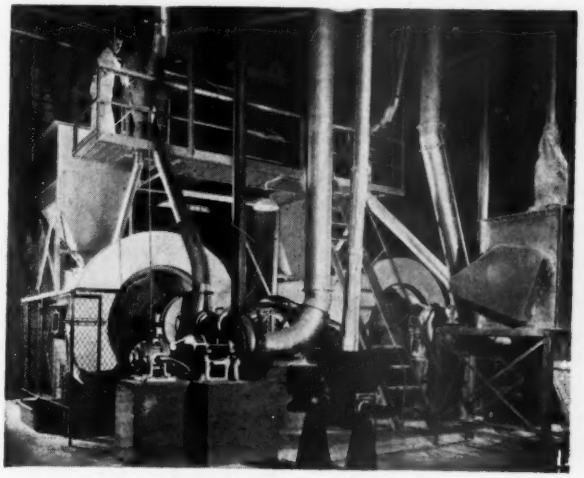


FIG. 6.—Conical mills equipped with loop classifiers.

usually is equipped with a quick-discharge grate (Fig. 7). This prevents over-grinding and allows the unit to handle a high circulating load. Rod mills have been used, but in most cases they are good only for open-circuit operation. Attempts to close-circuit the rod mill have not been successful, as over-feeding these mills spreads the rods and reduces grinding efficiency.

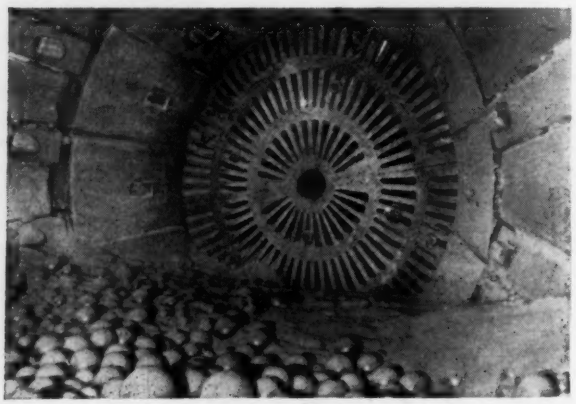


FIG. 7.—Mill equipped with quick-discharge grate.

VII. Use of Reverse-Current Air Conveying

Recent installations of conical ball and pebble mills have used a simple reverse-current air-conveying system with a vibrating screen mounted under the cyclone product-collector discharge (Fig. 8). The tailings from the screen are returned to the feed end of the mill by gravity. Such a system makes a moderately fine product with minimum superfine content. Such a system should be used for enamel frit grinding, when not more than 60% should go through a 200-mesh screen but all through a 40-mesh screen. By varying the suction on the mill, almost any reasonable circulating load can be maintained.

VIII. Drying and Grinding

Several combined drying and ball-milling installations have been made. In general, when the original moisture content does not exceed 7% and a slight dust loss is not objectionable, a Thermomill can be used to advantage (Fig. 9). Such materials as feldspar, sand, chrome ore, and clays are being ground in this type of mill. Entering temperatures should be around 900°F. Vent temperatures should be maintained above 160°F. to prevent condensation in the vent dust collectors. The piping and product collector should be insulated. In all cases, the capacities of these units are lower than when fed with a bone-dry product, as the mill drying slows down the grinding process.

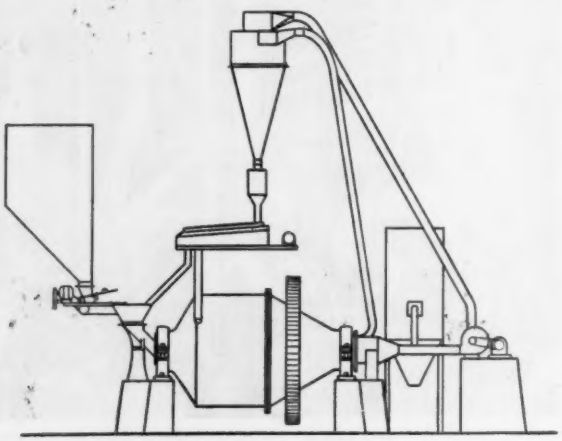


FIG. 8.—Air-swept mill with vibrating screen.

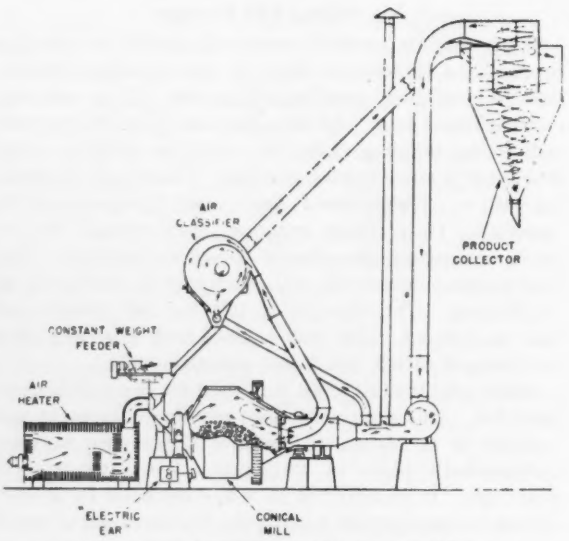


FIG. 9.—Thermomill and loop classifier.

The selection of this type of unit depends on the material to be ground, its moisture content, space limitations, and the capacity desired.

The cost usually is less than when separate rotary driers are used, but in some cases hot gases from the auxiliary furnace cannot be used because of possible contamination of the product, and heated clean air from an indirect-fired air heater must be used. Moisture in the form of vapor is difficult to handle through a cloth-screen-type dust collector and care should be taken to keep the vent free at all times. Auxiliary cyclone-type collectors are sometimes used to collect the vented dust but are not very efficient.

IX. Grinding and Flotation

Progress has been made in the flotation of such nonmetallics as talc, feldspar, spodumene, and limestone. A mill should be used which does not produce excessive slimes. The material should be ground to a point where all of the nonmetallics are separated from each other. Further grinding results in excessive slimes. A granular grind is desired, even though it is necessary to grind in some cases as fine as 100-mesh. The conical mill with a short cylindrical section or a grate-type cylindrical mill in closed circuit with a wet classifier should be used. High circulating loads tend to reduce slimes. In some instances, particularly on a friable material, single-pass wet-grinding rod mills are desirable. These mills produce a granular product with minimum slimes but are not as efficient as a ball mill.

An 8-foot conical pebble mill charged with adamant silica pebbles is wet-grinding $-1/2$-inch spodumene (lithium aluminum silicate) ore in closed circuit with a classifier to 2% +35-mesh, 37% −200-mesh at the rate of 180 tons per 24-hour day on 110 h.p. Pebble wear is 5 pounds per ton of finished product. The classifier overflow, at 45% solids, is deslimed in a slime cone, sent to agitators or conditioners, again deslimed, and finally sent to flotation for the separation of spodumene, feldspar, and quartz. The concentrates are filtered, dried in a direct-heat parallel-flow rotary oil-fired drier.

Owing to rather high slime loss, the use of a vibrating screen in place of the wet classifier is being considered. On relatively coarse grinds, screening will usually result in better separation and less finished product in the oversize than wet classification. A screen of sufficient size to handle the maximum circulating load of the grinding mill should be selected.

Other ceramic materials now being dry-ground in conical ball and pebble mills are ganister rock tailings from screens following dry pans, crushed brick bats for patching cement, chrome clinker and magnesite for refractories, calcined clay tailings from a dry pan, feldspar, fluorspar, ilmenite for titanium dioxide pigments, sodium silicate (water glass), pyrophyllite, silica sand, quartz rock, cullet, bentonite, corundum, and cement clinker.

X. Auxiliary Equipment

Mill operation has been improved considerably by the use of constant-weight feeders and automatic feed control. The Electric Ear, a device which regulates feed (depending upon the sound from the mill), has increased capacity, prevented overloading, reduced ball, pebble, and lining wear, and considerably reduced labor. It consists primarily of a microphone mounted close to the mill shell at the point of greatest ball or pebble impact, a control box with amplifying apparatus, mercoid switch, relay, and dial. The power line to the feeder motor is connected to the mercoid switch. The feeder motor stops and starts, depending upon the desired sound level from the mill. The most efficient sound level can be maintained, thus keeping the mill at maximum capacity. Usually the feeder is set at a 10% greater feed rate than the maximum mill capacity. As soon as the mill begins to quiet down, because of over-feeding, the Electric Ear control stops the feeder. When the noise level becomes higher, indicating that the mill is ready for more feed, the Electric Ear starts the feeder.

XI. Test Plants Available

The selection of the right type and size of grinding mill is no longer a matter of guesswork. Most manufacturers now have laboratories or test plants wherein liberal samples of materials on which the manufacturer has had no previous experience can be ground to determine grindability, power per mesh ton, proper method of separation, screen analyses of finished product, and any other data required to make accurate recommendations. The writer's company maintains a test plant to study new processes and equipment. Operation reports, covering every installation on which it is possible to obtain reliable data, are on file.

HARDINGE COMPANY, INCORPORATED
YORK, PENNSYLVANIA

RECONVERSION OF CORNING CANADIAN PLANT

Corning Glass Works has announced that reconversion for glass manufacturing will be undertaken immediately at the Leaside, Ontario, plant in Canada, recently purchased from the Dominion Government. Operations will be handled by Corning Glass Works of Canada, Ltd., a new company. The Leaside plant was part of the properties at this location operated by Research Enterprises, Ltd., during the war.

When the new Corning plant begins operations, scheduled for the spring of 1946, it will manufacture Pyrex-brand baking ware, the first to be made in the Dominion. Operations may eventually be broadened to cover the manufacture of other types of glassware. Baking ware and other glass products have heretofore been supplied to the Canadian market from Corning's plants in the United States.

Officers and directors of Corning Glass Works of Canada, Ltd., will be Amory Houghton, chairman; Glen W. Cole, president; Eugene W. Ritter, vice-president; and John L. Ward, secretary-treasurer. In addition to these officers, the directorate will include Charles D. LaFollette, Benjamin S. Peirson, and Arthur W. Weber, all associated with the parent company. H. C. Bates, formerly director of the Optical Glass Division of Research Enterprises, Ltd., has been appointed general manager.

Mr. Bates, a native of Glanford, Ontario, and a Toronto University graduate, is a former employee of Corning Glass Works, having worked at the company's Main Plant in Corning, N. Y., from 1926 to 1938. When commercial production of glass fiber was begun, he joined the Owens-Corning Fiberglas Corp., Newark, Ohio.

In the fall of 1940, Mr. Bates returned to Canada to work for the Dominion Government and was assigned to optical glass manufacture at Research Enterprises, Ltd. He went to England in November, 1940, to observe English manufacturing methods and returned to Canada the following April to take charge of optical glassmaking and to become one of the directors of the Instrument Division of Research Enterprises, Ltd.

Although in the past Corning baking ware has enjoyed wide acceptance in Canada, it is hoped that the new plant, which is Corning's first manufacturing venture in the Dominion, will facilitate the distribution of the Corning line to Canadian customers and that the enterprise will become a permanent and constructive factor in the development of Canada's peacetime domestic and export trade.

Corning Glass Works' consumer products will continue to be distributed through the John A. Huston Company of Toronto, with warehouses in Toronto, Montreal, Winnipeg, and Vancouver.

PITTSBURGH PLATE ANNUAL REPORT WINS AWARD

The Pittsburgh Plate Glass Co., Pittsburgh, Pa., has received the Highest Merit Award for its 1944 Annual Report.

This Award is issued annually by *Financial World*, one of the nation's leading financial journals. The citation accompanying the Award stated that it was made "For Distinguished Achievement in Annual Reporting in recognition of the excellence of its 1944 Annual Report to Stockholders."

The Pittsburgh Plate report was judged as among the most modern from the standpoint of content, typography, and format. More than 1250 annual reports from all types of business and industrial companies were examined by *Financial World* before making the Award.

TECHNICAL SOCIETIES STUDY ENGINEERING AND SCIENTIFIC TRAINING

A meeting was held at the National Academy of Sciences, Washington, D. C., September 7, 1945, to discuss action which will make possible the resumption of engineering and scientific training necessary as a foundation for economic and national security.

There were twenty persons present representing various technical, scientific, and educational societies, including, among others, the Office of Scientific Research and Production, the American Association for the Advancement of Science, the American Institute of Mining and Metallurgical Engineers, the American Chemical Society, the Society of Automotive Engineers, the National Research Council, the National Educational Council, and the American Society of Mechanical Engineers. The presiding officer was W. L. Everitt of the University of Illinois.

The basis of discussion was the problem involved in the proposed continuation of Selective Service which will call into the Army young men coming of age 18 as well as the probable induction of young men from 19 to 25, inclusive, who have previously been deferred. Among these latter will be many scientific and technical men who will be lost to their respective fields for a probable two-year period.

It was considered necessary for the security of the Nation that (1) an attempt be made to provide for the rebuilding of the sadly depleted scientific and technical personnel of the country by preventing the absorption of men in these categories into the armed forces on a mass basis and (2) provision be made immediately for the resumption of the education and training of young men suited for scientific and technical work in view of the great lapse of time since the graduation of the last normal classes from engineering and scientific schools.

Preliminary discussion centered about the method of attack. It was recognized that to ask for deferment of all men signifying intention of entering scientific school would be looked upon with disfavor by both the military authorities and Congress and that such action might be considered as "class legislation." It was eventually decided that the best method of procedure would be to press for an amendment to the Selective Service Act which would permit assignment of men *after induction into the armed forces* to colleges for courses of study in science and engineering.

In connection with this decision, several motions were presented representing the sense of the meeting regarding various particulars of this program. These motions were made to guide a committee appointed to formulate and draw up in proper style a request for help by the Military and Naval Affairs Committees of both Houses of Congress, which it was hoped would lead to the desired amendment to the Selective Service law.

Preliminary statements anticipated that length of service of inductees in the near future will be about two years. The number available from the age group 18 is insufficient to satisfy military needs, so some present troops may be expected to stay in service for approximately a two-year period.

Engineers and scientists who have lately been taken into service generally have low-point scores due to their previous deferments and late induction. Ordinarily they could not be expected to be released in the near future. Efforts should be made to secure engineering and scientific students to avoid prolongation of the gap since graduation of the last normal classes. It is not expected that enough men can be trained to make up in a reasonable time for the present scientific personnel shortage, but at least as many should be trained as were entering before the war period. It is considered not feasible to attempt to secure students by deferments from military service. It is therefore suggested that the Selective Service law be amended to assign men to college for *regular* scientific and engineering courses in a manner similar to the former A.S.T.P. program. The following motions were carried:

(1) That allocation of men for scientific and engineering training be made after induction rather than by deferment.

(2) That the selection for training should be made by recognized and proved selection processes which may include IQ tests, competitive examination, aptitude tests, and the applicant's standing in his high-school class.

(3) Selection of men to be assigned to training should be as far in advance of induction as possible. This can be accomplished by first passing a pre-induction physical and submitting to the selective tests before actual induction. This would permit men to enter at the beginning of college terms who would normally be coming of age 18 or facing induction because of cancellation of deferment during the college year and would allow planning ahead by the students. This procedure is similar to the well-known Eddy test given by the Navy to secure radio students before induction.

(4) Selection of applicants for training should be administered by the War Manpower Commission. It is understood that WMC already is engaged in advising and guiding Selective Service on induction and therefore is the logical agency to handle the new program.

(5) Men should be assigned to accredited colleges of their own choice to take regular courses in science and engineering in the regular curricula rather than any specified courses prescribed by the services. Men should be expected to attend college during the normal nine school months and then to be subject to military training during the other three months to satisfy military obligations under the Selective Service Act. It was recognized that Selective Service would not agree to a three-month vacation.

(6) Men assigned to colleges would be free to join ROTC or Naval units but would not be obligated to do so.

(7) Benefits under this program in the way of tuition or subsistence would be limited to those available to veterans under the G. I. Bill of Rights.

(8) Approval was given that portion of the report by Dr. Vannevar Bush relating to the immediate release from service of all scientific and technical men not urgently needed.

It is eventually hoped that formal approval for each organization shall be made by its governing board, but in the event that such formal approval cannot be secured within the next thirty days, it is hoped that the president of the organization can signify his approval and follow later with board action to present the formalized opinion of the entire organization.

Before the formal consideration of this proposal by the several Military and Naval Affairs Committees, it is hoped that representatives of the various societies can get in touch with the members of these committees to inform them fully regarding each organization's interest in this proposal and to set before them the present conditions with respect to the shortage of trained personnel and the need of new personnel.

—J. E. EAGLE

Since the above report was prepared by Mr. Eagle, the subcommittee has prepared a formal resolution on this subject for presentation to the officers of the various societies for approval or comment. As soon as action is taken by the officers of a number of the societies, an appropriate resolution will be presented to the affected committees of Congress.

MEMBERSHIP ROSTER OF THE AMERICAN CERAMIC SOCIETY

The Roster of paid members is being published for the use of the members of The Society. The list is alphabetical; Corporation Members are in black-face type, the name of the voting representative following in parentheses; Fellows are preceded by *; Institute of Ceramic Engineers are preceded by †; Charter Life, Life, Honorary, and Student Members are indicated after their respective names.

Abbé Engineering Co. (H. F. Kleinfeldt), 50 Church St., New York 7, N. Y.
Abbey, R. G., General Refractories Co., 1600 Real Estate Trust Bldg., Philadelphia 7, Pa.
Abingdon Potteries, Inc. (R. E. Bidwell), Abingdon, Ill.
Abrahams, Samuel A., Plant Rubber & Asbestos Works, 537 Brannon St., San Francisco 7, Calif.
Abramson, Isaac (Student), 104 15th Ave., Columbus 1, Ohio
Achatz, Clifford F., 1417 Pacific Ave., Brackenridge, Pa.
Ackerson, C. H., Washington Porcelain Co., Willow St., Washington, N. J.
A C Spark Plug Div., General Motors Corp. (Taine G. McDougal), Flint 2, Mich.
Adair, Robert B., 125 Craven St., Beaufort, N. C.
Adams, John, Carter, Stabler & Adams, Ltd., Poole, Dorsetshire, England
Adams, Leason H., 2801 Upton St., N. W., Washington 8, D. C.
Adamston Flat Glass Co., Box 631, Clarksburg, W. Va.
Adcock, Albert S., American Radiator & Standard Sanitary Corp., Box 1866, Richmond, Calif.
Adderley, James R., 42 Church St., Brierley Hill, South Staffordshire, England
Aderhold, George H., Saxonburg Potteries, Saxonburg, Pa.
Agarwal, S. N., Prag Narain Rd., Rawatpara, Agra, India
Agnew, G. D., Universal Potteries, Inc., Cambridge, Ohio
Ahearn, V. P., National Industrial Sand Assn., 951 Munsey Bldg., Washington 4, D. C.
Akam, J. W., Aldershot, Ontario, Canada
Akron Porcelain Co. (F. W. Butler), Akron 14, Ohio
Alabama Clay Products Co. (A. S. Holberg), 830–835 Martin Bldg., Birmingham 3, Ala.
*†Albery, D. F., 2829 8th St., N. W., Canton 3, Ohio
Albright, E. C., Gem Clay Forming Co., Sebring, Ohio
Alexander, Fred, 725 Munroe St., New Castle, Pa.
Alexander, John B., Southwestern Portland Cement Co., Xenia Ave., Osborn, Ohio
Allen, A. R., Gibbons (Dudley), Ltd., Dibdale Works, Dudley, Worcestershire, England
Allen, Alfred W., 404 E. Chalmers St., Champaign, Ill.
Allen, Horace E., 2248 Parkwood Ave., Toledo 10, Ohio
Allison, Adrian G., R. D. 1, Marengo, Ohio
Allison, LeRoy W., Ceramics Publishing Co., Inc., Box 173, Newark, N. J.
Allshouse, Homer J., 303 Fourth Ave., Derry, Pa.
†Alt, Leslie R., Kraftile Co., Niles, Calif.
Alton Brick Co. (Rand Rodgers), Alton, Ill.
Alvarez, Juan H., Calle 62, No. 47-24, Medellin, Colombia
Alves, J. Rodrigues, Caixa Postal 278, São Paulo, Brazil
Amarante, Armando, Rua da Quitanda No. 82, 7° andar, São Paulo, Brazil
*†Amberg, Charles R., Box 122, Alfred, N. Y.
American Clay Forming Co. (Ross Stoffer), Tiffin, Ohio
American Colloid Co. (Paul Bechtner), 363 W. Superior St., Chicago 10, Ill.
American Crucible Co. (R. E. Burdett), Shelton, Conn.
American Emery Wheel Works (Harold O. Skoog), 1 Richmond Sq., Providence 1, R. I.
American Gas Assn. (C. G. Segeler), 420 Lexington Ave., New York 17, N. Y.
American Glassware Assn. (H. L. Dillingham), 19 West 44th St., New York 18, N. Y.
American Lava Corp. (Paul J. Kruesi), Chattanooga 5, Tenn.
American Nepheline Corp. (H. R. Deeth), Rochester 12, N. Y.
American Optical Co. (E. D. Tillyer), Southbridge, Mass.
American Porcelain Enamel Co. (Robert Long), 1205 Keating Ave., Muskegon 36, Mich.
American Potash & Chemical Corp. (R. M. Curts), 122 East 42nd St., New York 17, N. Y.
American Radiator & Standard Sanitary Corp. (H. S. Magid), Box 907, Trenton 5, N. J.
American Radiator & Standard Sanitary Corp. (Erwin Sohn), 1541 South 7th St., Louisville 8, Ky.
American Refractories Institute, 1872 Railway Exchange Bldg., St. Louis 1, Mo.
American Rolling Mill Co. (F. G. Sutphen), Middletown, Ohio
American Smelting & Refining Co. (L. G. Matthews), 120 Broadway, New York 5, N. Y.
American Stove Co. (Arthur Stockstrom), St. Louis, Mo.
American Valve & Enameling Corp. (Charles A. Wulf), Box 114, Indianapolis 6, Ind.
American Window Glass Co. (A. S. Crandon), 16th Floor, Farmers Bank Bldg., Pittsburgh 22, Pa.
Ammerman, J. H., 414 W. Church St., Lock Haven, Pa.
Ammon, Millard G., 14605 Caldwell Ave., Cleveland 11, Ohio
Amsler-Morton Div., Union Mining Co. (P. M. Offill), Fulton Bldg., Pittsburgh 22, Pa.
Anchor Hocking Glass Corp. (W. V. Fisher), Lancaster, Ohio
Ancizar-Sordo, Jorge, Laboratorio Químico Nacional, Ministerio de Minas y Petróleos, Apartado 2577, Bogotá, Colombia
Anderegg, Frederick O., Pierce Foundation, Raritan, N. J.
Anderson, R. E., Robertson Mfg. Co., Box 848, Trenton 5, N. J.
Anderson, Rupert C., Carr China Co., Box 382, Grafton, W. Va.
Anderson, Theodore E., 724 Frick Bldg., Pittsburgh 19, Pa.
Andreasen, A. H. M. (Honorary), Oster Voldgade 6 c, Copenhagen K., Denmark
Andres, Adele M., 1356½ S. Orange Dr., Los Angeles, Calif.
Andreson, Laura, Univ. of California, Los Angeles, Calif.
*†Andrews, Andrew I., Ceramics Bldg., Univ. of Illinois, Urbana, Ill.
Andrews, Clifford M., 204 Ceramics Bldg., Urbana, Ill.
Angevine, John S., 10 Forest Place, Massena, N. Y.
Anicetti, Robert J., Metal Hydrides, Inc., 14 Congress St., Beverly, Mass.
Ankeny, C. W., 205 W. Wacker Dr., Chicago 6, Ill.
Antaki, Emile, Calle España 402/600, Avellaneda, Buenos Aires, Argentina
Anthony, George F., Universal Sanitary Mfg. Co., New Castle, Pa.
Anwyl, Robert H., 4419 Sinclair, Austin 21, Texas
Aradine, Paul W., Taylor Instrument Companies, Box 110, Rochester 1, N. Y.
Arango, G. Botero, Balboa 63-13, Medellin, Colombia
Archbold, Walter H., Jr., Kleyona, Phoenixville, Pa.
Archie, Chad L., Jackson Brick & Clay Products Co., Corinth, Miss.
Arensberg, Francis L., Vesuvius Crucible Co., Box 8275, Swissvale, Pittsburgh 18, Pa.
Arketex Ceramic Corp. (George Shoemaker), Brazil, Ind.
Armant, Lt. David L., New York, N. Y.
Armistead, W. H., 65 E. First St., Corning, N. Y.
Armstrong Cork Co. (E. C. Emanuel), Research Labs., Lancaster, Pa.

†Armstrong, Leland R., 68 McKennan Ave., Washington, Pa.
*†Arnold, Howard C., 76 Standish Blvd., Pittsburgh 16, Pa.
*Arnold, R. E., 543 Glenwood Rd., Glendale 2, Calif.
†Arnold, Thomas M., Red Wing Potteries, Inc., Red Wing, Minn.
†Arrance, Frank C., 411 Elm St., Fostoria, Ohio
Arrandale, Roy S., 906 W. First St., Elmira, N. Y.
Arras, George, 32 S. Peoria St., Chicago 7, Ill.
Arwine, Alva S., R.D. 2, Norristown, Pa.
Asgeirsson, Haraldur (Student), 605 E. Daniel St., Champaign, Ill.
Asher, John W. (Student), 1 Franklin Place, Morristown, N. J.
Ashworth, George L., & Brothers, Ltd. (R. L. Evans), Broad St. Works, Hanley, Stoke-on-Trent, England
Associated Engineers, Inc. (Paul A. Mankin), 230 E. Berry St., Fort Wayne 2, Ind.
†Athy, Lyman C., 801 E. Belvedere Ave., Baltimore 12, Md.
Atkins, Kenneth D., 312 N. York, Martinsville, Ill.
Atkins, Robert A., Niles Rolling Mill Co., Warren Ave., Niles, Ohio
Austenal Laboratories, Inc. (Paul F. Collins), 5932 Wentworth Ave., Chicago 21, Ill.
Austin, Alfred E., 168 Cedar St., Corning, N. Y.
Austin, Arthur O., Box 109, Barberton, Ohio
*Austin, Chester R., Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio
*Austin, James B., Research Lab., U. S. Steel Corp., Kearny, N. J.
Austin, Janet, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore 5, Md.
†Austin, J. L., Carborundum Co., Niagara Falls, N. Y.
Austin, Lewis M., East Ave. and Oxford St., Vineland, N. J.
*Ayars, Alice A., 12479 Cedar Rd., Suite 201, Cleveland Heights 6, Ohio
†Aydelott, Elliott C., Murray Corp., 7700 Russell St., Detroit 11, Mich.

Baab, Kenneth A., 230 West 9th Ave., Columbus 1, Ohio
Babcock & Wilcox Co. (A. M. Kohler), 85 Liberty St., New York 6, N. Y.
Babcock, Clarence L., 1718 Potomac, Toledo, Ohio
Babcock, M. G., Pittsburgh Plate Glass Co., 2000 Grant Bldg., Pittsburgh 19, Pa.
†Babcock, Paul R., Frenchtown Porcelain Co., Frenchtown, N. J.
Bacher, Holland R., Rock Tavern, N. Y.
Bachman, Edith Carr, Carr China Co., Grafton, W. Va.
Bachman, Wheeler Carr, Carr China Co., Grafton, W. Va.
Backus, Lulu S., 451 S. Goodman St., Rochester 7, N. Y.
Bacon, C. H., John Summers & Sons, Ltd., Hawarden Bridge Steel Works, Shotton, Chester, England
Bacon, Frank R., 2115 Alvin St., Toledo 7, Ohio
*Badger, Alfred E., Dept. of Ceramic Engr., Univ. of Illinois, Urbana, Ill.
Baer, John G., 125 N. Kellogg St., Elsinore, Calif.
Baez, Jose D., Parque Lira 133, Tacubaya, Mexico City, Mexico
Bager, Frederic E., T. L. Smith Co., 2835 North 32nd St., Milwaukee 10, Wis.
*Baggs, A. E., Dept. of Fine Arts, Hayes Hall, Ohio State Univ., Columbus 10, Ohio
Bahnsen, Monroe J., 2111 Concord Dr., Lakewood 7, Ohio
Bailey, Cuthbert, Doulton & Co., Ltd., Burslem, Staffordshire, England
†Bailey, Floyd, 505 Bullocks Point Ave., Apt. 3, Riverside 15, R. I.
*Bailey, James, 95 Steele Rd., West Hartford 7, Conn.
Bailey, Richard F., Pacific Tile & Porcelain Co., Box 638, Hynes, Calif.
Bain, Andrew R., "The Whins," 26 Park Terrace, Stirling, Scotland
*†Bair, George J., Research & Development Dept., Corning Glass Works, Corning, N. Y.
Baker, Arvid H., 25 Pine St., Port Allegany, Pa.
Baker, Donald R., Box 134, East Canton, Ohio
Baker, Houston R., 158 East 3rd St., Corning, N. Y.
†Baker, Martin, 513 Brady Ave., Apt. A, Barberton, Ohio
Baker, Theodore C., 335 E. Indiana St., Perrysburg, Ohio
Balcom, Philip D., 124 Greenleaf St., Quincy 69, Mass.
Baldwin, William J., Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
*†Bales, C. E., Ironton Fire Brick Co., Ironton, Ohio
Balinkin, Isay A., Univ. of Cincinnati, Cincinnati 21, Ohio
Ball Brothers Co. (G. A. Ball), Muncie, Ind.
Ball, G. A., Ball Brothers Co., Muncie, Ind.
Bankson, John P., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
*Barker, George J., Dept. of Mining and Metallurgy, College of Engr., Univ. of Wisconsin, Madison 6, Wis.
Barkwell, Bernard T., 3, Marstone Crescent, Totley, Sheffield, England
*Barlett, Helen B., A C Spark Plug Div., General Motors Corp., Flint 2, Mich.
Barr, James A., Jr., Chemical Div., Armour & Company, 1355 West 31st Street, Chicago 9, Ill.
Barrett, Lionel R., Mellor Labs., Shelton, Stoke-on-Trent, England
Barrett, Maurice, 66, Norton Rd., Morecambe & Heysham, England
*†Barringer, L. E., 23 Front St., Schenectady 5, N. Y.
Bartels, Keith D., c/o J. E. Kennedy, R.D. 1, Box 870, Homestead, Pa.
Bartholomew, Tracy, 1545 Beechwood Blvd., Pittsburgh 17, Pa.
Bartlett-Collins Co. (D. C. Hamilton), Sapulpa, Okla.
Bartlett, E. E., R.D. 1, Box 141, Brownsville, Texas
Bartlett, Willard J., Glass Technology Lab., General Electric Co., 1133 East 152nd St., Cleveland 10, Ohio
*Barton, G. E., 227 Pine St., Millville, N. J.
Barzaghi, Luciano, 104 Fifteenth Ave., Columbus, Ohio
Bassett, Leon B., 41 W. University St., Alfred, N. Y.
Bassett, Robert, A. W. Whitford Co., Darlington, Beaver County, Pa.
Bastress, Alfred W., Glass Science, Inc., State College, Pa.
Bateman, L. A., National Sanitary Co., Salem, Ohio
Bates, Charles, 128 Walnut St., Brookville, Pa.
Bates, Edgar A. (Student), 360 Westmoreland Rd., Snyder, Buffalo 21, N. Y.
Bates, H. Clifford, Research Enterprises, Ltd., Leaside, Ontario, Canada
*Bates, P. H., 3835 Livingston St., N. W., Washington 15, D. C.
Batie, J. E., Kelsey-Hayes Wheel Co., 3600 Military Ave., Detroit 32, Mich.
†Baumann, Henry N., Jr., 1275 Wyoming Ave., Niagara Falls, N. Y.
Baumler, Karl, Medicine Hat Potteries Div., Alberta Clay Products Co., Ltd., Medicine Hat, Alberta, Canada
Bausch & Lomb Optical Co. (Murray Scott), Rochester 2, N. Y.
Bay State Abrasive Products Co. (O. S. Buckner), Westboro, Mass.
Beals, M. Douglas, 33 Grove St., Perry, N. Y.
*†Beam, James R., 226 Euclid Ave., New Castle, Pa.
Beathard, Robert K., General Tile Corp., Box 38, El Segundo, Calif.
Beatty, Ross J., Jr., 332 S. Michigan Ave., Suite 1950, Chicago 4, Ill.
Beaumont Co. (A. B. Beaumont), Morgantown, W. Va.
Beaumont, A. B., 249 Dormont St., Morgantown, W. Va.
Bechtner, Paul, American Colloid Co., 363 W. Superior St., Chicago 10, Ill.
Beck, Norman R., Carr-Lowrey Glass Co., Box 356, Baltimore 3, Md.
Beck, Warren R., Ceramics Research Dept., Minnesota Mining & Mfg. Co., St. Paul 6, Minn..
Beckemeyer, Harry J. (Student), c/o Mrs. H. J. Beckemeyer, Box 106, Hillsboro, Ill.
Becker, Martin G., Box 542, Brookhaven, Miss.

*†Beecher, Milton F., Norton Co., Worcester 6, Mass.
Beeman, Earle A., 629 Buhl Bldg., Detroit 26, Mich.
Beeton, Earl E., 861 Cross Ave., Elizabeth 3, N. J.
Behlen, D. J., Harshaw Chemical Co., Intelligence Service Div., 1945 East 97th St., Cleveland 6, Ohio
Behrend, Oswald, 823 Park Ave., Vineland, N. J.
Behringer, Harold, Tygart Valley Glass Co., Washington, Pa.
Beinlich, Alfred W., House 109, Village 2, Sheffield, Ala.
Belden Brick Co. (P. B. Belden), Canton, Ohio
Belden, P. B., Belden Brick Co., Canton, Ohio
Bell & Howell Co. (R. B. Snyder), 7100 McCormick Rd., Chicago 45, Ill.
Bell, Fred S., Box 242, Gleason, Tenn.
Bell, W. C., Severna Park, Md.
Bellaire Enamel Co. (Charles Kapner), Bellaire, Ohio
Below, Henry, R. D. 1, Morrisville, Pa.
Benas, Mrs. F. M. (Student), 66 Potomac St., San Francisco, Calif.
Benner, Raymond C., 460 College Ave., Niagara Falls, N. Y.
Benner, W. J., 912 Pontiac Rd., Wilmette, Ill.
Bennett, Alva H., American Optical Co., Scientific Instrument Div., 19 Doat St., Buffalo 11, N. Y.
*†Bennett, A. Lee, 4407 52nd Ave., N. E., Seattle, Wash.
*Bennett, Dwight G., 204 Ceramics Bldg., Univ. of Illinois, Urbana, Ill.
Bennett, Frederick R., Box 325, Hartsville, S. C.
†Bennett, Myles P., 5088 Alhambra Ave., Los Angeles 32, Calif.
Bentley, Frederick, Trenton Potteries Co., Trenton 1, N. J.
Benton, George A., Genesee Feldspar Co., Inc., 360 Boxart St., Rochester 12, N. Y.
Berg, Morris, USNR, San Francisco, Calif.
Bergmans, Carl, 601 Milwaukee Ave., South Milwaukee, Wis.
†Berkelhamer, Louis H., U. S. Bureau of Mines, Southern Expt. Sta., Tuscaloosa, Ala.
Bernardini, Guy F., 425 Main St., Latrobe, Pa.
Berns, Milton H., 24 Oliver St., Hamburg, N. Y.
Bernstorf, Robert B., 336 Sherman Ave., Teaneck, N. J.
Berry, C. W., 104 Aberdeen Place, Clayton, Mo.
Besley, John S., Hill Blvd., East Liverpool, Ohio
†Betz, George C., 131 Livingston Ave., New Brunswick, N. J.
Bevan, Arthur, University, Box 1428, Charlottesville, Va.
†Bevis, Ralph E., Gibraltar 1365, Villa Marconi, Avellaneda, F.C.S., Buenos Aires, Argentina
B. G. Corp. (Frank J. Fallon), Ridgefield, N. J.
Bhagat, M. G., 11 Rawdon St., Calcutta, India
Bhalla, Amrit K., Lahore Enameling & Stamping Co., Putlighar, Jullundur City, Punjab, India
Bickford, Fred A., 75 East 2nd St., Corning, N. Y.
Bicknell, R. S., 1516 Sunset Rd., Chattanooga 5, Tenn.
Biddulph, Albert, 11 Holden Rd., Penn, Wolverhampton, England
Bidwell, George E., 605 W. Martin St., Abingdon, Ill.
Bidwell, R. E., Abingdon Potteries, Inc., Abingdon, Ill.
Biggs, Henry C., Messrs. John G. Stein & Co., Ltd., Bonnybridge, Scotland
Binks Manufacturing Co. (E. F. Watts), 3114 Carroll Ave., Chicago, Ill.
*†Birch, Raymond E., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
Bishop, Frederic L., Jr., 301 Pershing Dr., New Kensington, Pa.
Black, H. R., Libbey Glass, Div. of Owens-Illinois Glass Co., Toledo 1, Ohio
Black, Lloyd V., 1006 Oregon Ave., Tarentum, Pa.
†Blackburn, A. R., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
†Blackwood, James M., 59 W. Royal Forest Blvd., Columbus, Ohio
Blaha, Emil, 117 Central Ave., Cheltenham, Pa.
Blair, Claude C., Metropolitan Paving Brick Co., 1017 Renkert Bldg., Canton 2, Ohio
*Blair, Marion W., 2131 S. Center St., Terre Haute, Ind.
Blake, A. E., 78 Park Ave., West Caldwell, N. J.
Blake, Edwin M., Box 210, Mount Kisco, N. Y.
Blake, William V., Macklin Co., Jackson Mich.
Blakely, Alexander M., 70 Water St., West Haven 16, Conn.
Blanchard, M. Kenneth, A. O. Smith Corp., 3533 North 27th St., Milwaukee, Wis.
*Blau, H. H., Federal Glass Co., 515 E. Innis Ave., Columbus 7, Ohio
*†Bleininger, A. V. (Honorary, Charter Life), Homer Laughlin China Co., Newell, W. Va.
Blenko, W. H., Blenko Glass Co., Milton, W. Va.
Blessing, George M., 5 Edwards St., Hartford 5, Conn.
†Blewett, J. B., McLain Fire Brick Co., Wellsville, Ohio
Bliley Electric Co. (J. M. Wolfskill), Union Sta. Bldg., Erie, Pa.
Bloch, Joseph, J. Bloch & Sons, 157 Spring St., New York 12, N. Y.
Blodgett, Malcolm, 660 Main St., Woburn, Mass.
Bloor, C. A., Universal Clay Products Co., Sandusky, Ohio
Bloore, Robert, Swinnerton, Ltd., Stoke-on-Trent, England
Blount, Bruce (Student), Box 1602, University Sta., Austin 12, Texas
Blue Ridge Glass Corp. (J. H. Lewis), Kingsport, Tenn.
†Blume, Capt. Arthur J., Ft. Hayes, Ohio
†Blumenthal, George, Box 224, Trenton, N. J.
*Blunt, Royden A., Buck Glass Co., Fort Ave. and Lawrence St., Baltimore 30, Md.
Blythe Colour Works, Ltd. (Norman R. Wildblood), Cresswell, Stoke-on-Trent, England
†Boeker, V. W., Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio
Boettner, George B., 273 Chestnut St., Corning, N. Y.
†Bognar, Edwin J., McKelvy-Bognar, Inc., 509 Oliver Bldg., Pittsburgh 22, Pa.
Bohn, Edward L., Box 58, Annex Sta., Cincinnati 14, Ohio
*Bole, George A., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Bolin, Edwin P., 440 W. North Ave., Elmhurst, Ill.
Bollinger, Robert H., 216 Hazelwood Ave., Bound Brook, N. J.
Bolton, Harry L., Philadelphia Quartz Co., 121 S. Third St., Philadelphia 6, Pa.
Bolz, Leonard H., 4128 Seventh St., Washington, D. C.
Bond, J. W. G., Pike Brothers, Ltd., Wareham, Dorsetshire, England
Bondarev, Konstantin J., Vsesousnji Institut Stekla, Bolshaja Semenovskaja Ulitza N 10, Moscow, U.S.S.R.
Bonnot Co. (B. T. Bonnot), Canton, Ohio
Bonnot, B. T., Bonnot Co., Canton, Ohio
Booth, Franklin, 1091 S. Oak Knoll Ave., Pasadena 5, Calif.
Booth, John F., Hazlehead Hall, Penistone, near Sheffield, Yorkshire, England
Booth, Seaver H., 40 Franklin St., Ansonia, Conn.
*†Booze, M. C., Charles Taylor Sons Co., Box 58, Annex Sta., Cincinnati, Ohio
Bopp, Harold F., 67 Gorton St., Corning, N. Y.
Botfield Refractories Co. (A. H. Engstrom), Swanson and Clymer Sts., Philadelphia 47, Pa.
Botfield, George B., 210 Valley Rd., Merion Station, Pa.
Botvinkin, Oleg K., Ljalin 8, App. 19, Moscow 64, U.S.S.R.
Bovee, Benedict A., 220 74th St., Niagara Falls, N. Y.
Bowden, James J., 2538 E. Market St., Warren, Ohio
*Bowes, Urban E., Owens-Illinois Glass Co., 1700 N. Westwood Ave., Toledo, Ohio
Bowman, John G., Water Brooks Farm, Schellsburg, Bedford County, Pa.
Bowman, Joseph V., 935 Winslow Ave., New Castle, Pa.
Bowman, Ralph M., Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio
Bown, Lewis H., Box 305, Lewiston, N. Y.
†Bowne, Martin S., Lee Clay Products Co., Clearfield, Ky.
Boyce, Robert E., Harker Pottery Co., East Liverpool, Ohio
†Boyd, John E., United Feldspar & Minerals Corp., Box M, Spruce Pine, N. C.

*†Boyd, Robert C., American Radiator & Standard Sanitary Corp., 1541 South 7th St., Louisville 8, Ky.
Boyles, John P., 409 E. Lincoln Ave., New Castle, Pa.
Bradley, Alan L., Refractory Brick Co. of England, Ltd., Steetley, near Worksop, Nottinghamshire, England
Bradley, Charles A., Jr., 21 East 4th St., Corning, N. Y.
*†Bradley, Richard S., 4 Park Circle, Mexico, Mo.
†Bradwell, Cyril, 924 Timberman Rd., Columbus, Ohio
Brady, Lt. John G. (Student), Lewvan, Saskatchewan, Canada
Brain, Douglas G., 1960 Jane St., R. D. 2, Weston, Ontario, Canada
†Bramlett, William P., Jr., 535½ North 3rd St., Millville, N. J.
Branda, Christopher, Refractory & Insulation Corp., Port Kennedy, Pa.
Brandow, Glen A., 69 W. Gibson St., Canandaigua, N. Y.
Brandt, Kristian H., Box 212, Red Bank, N. J.
Brandt, Neill M., 123 North Ave., Webster, N. Y.
†Brandt, William O., Gladding, McBean & Co., 8601 Dorothy Ave., South Gate, Calif.
Braun Corp. (J. G. Stewart), 2260 East 15th St., Los Angeles 21, Calif.
Braun, Julius, 300 N. Canal St., Chicago 6, Ill.
Braykovich, Andrew, Box 48, West Pittsburgh, Pa.
Brayton, Darlin E., Box 697, Laguna Beach, Calif.
Braz, Jack J., 128 West 24th St., New York 11, N. Y.
Breckenridge, James M., Vanderbilt Univ., Nashville, Tenn.
†Breeman, Leonard, Jr., Box 425, Bedford, Va.
Breene, George A., Industrial Colloids Co., Emlenton, Pa.
Breeze, Lewis K., 151 East 233rd St., Apt. 17, Euclid, Ohio
Brenner, Harold M., Box 519, Washington, Pa.
Brenner, R. F., Anchor Hocking Glass Co., Lancaster, Ohio
Bretz, Lewis A., 3332 N. Industry Rd., R. D. 5, Canton, Ohio
Brewer, Clarence T., 733 N. Waller Ave., Chicago 44, Ill.
Brewster, H. M., 2825 N. Wolcott St., Chicago 13, Ill.
Brian, Charles, Paper Makers Importing Co., Inc., Drake Bldg., Easton, Pa.
Brian, Dick, 422 Florida Ave., Chester, W. Va.
Brian, S. Douglas, Paper Makers Importing Co., Inc., Drake Bldg., Easton, Pa.
Brickseal Refractory Co. (Rexford Newcomb, Jr.), 1029 Clinton St., Hoboken, N. J.
Briganti, Lt. E. J. (Student), San Francisco, Calif.
Brinckerhoff, J. E., Babcock & Wilcox Co., 85 Liberty St., New York 6, N. Y.
Brintnall, Bert W., Box 501, Laguna Beach, Calif.
Brisch Brick Co. (Michael Brisch, Jr.), 228 N. La Salle St., Chicago 1, Ill.
Brisch, Michael, Jr., Brisch Brick Co., 228 N. La Salle St., Chicago 1, Ill.
British Ceramic Society, North Staffordshire Tech. College, Stoke-on-Trent, England
British Scientific Instrument Research Assn. (A. J. Philpot), 26 Russell Sq., London, W. C. 1, England
Britton, Marvin G., 201 Chemung St., Painted Post, N. Y.
Brockway Glass Co., Inc. (F. B. Hess), Brockway, Pa.
Brooke, Frederick H., Oughtibridge, Sheffield, England
Broomhall, Vincent, Continental Kilns, Inc., Box 292, East Liverpool, Ohio
Brosius, John P., Equitable Gas Co., 435 Sixth Ave., Pittsburgh 19, Pa.
†Brouk, Lt. (jg) J. John, Washington 20, D. C.
Brown, Davis, Rm. 516, 426 S. Spring St., Los Angeles 13, Calif.
Brown, Donovan P., 12023 Lake Shore Blvd., Cleveland 8, Ohio
Brown, F. O., Dunbar Glass Corp., Dunbar, W. Va.
Brown, George R., North American Mfg. Co., 2910 East 75th St., Cleveland 4, Ohio
Brown, H. K., Home Aid Construction Co., 527 Society for Savings Bldg., Cleveland 14, Ohio
Brown, Joseph A., Baltimore Brick Co., 3601 E. Monument St., Baltimore 5, Md.
*†Brown, Lawrence H., Box 632, East Liverpool, Ohio
*Brown, Wilbur F., Libbey-Owens-Ford Glass Co., 1701 E. Broadway, Toledo 5, Ohio
Browne, John E., 195 Wayne Dr., Motor Route 1, New Kensington, Pa.
Brownell, Wayne E., 126 Hornell St., Hornell, N. Y.
Brownewell, George E. (Student), 2445 Elm Ave., Bexley, Ohio
Brownlow, James M. (Student), Rm. 4-241, Massachusetts Inst. of Tech., Cambridge, Mass.
Bruce, Charles F., 413 Center Ave., Verona, Pa.
Brunning, Ernest J., Consumers Glass Co., Ltd., Box 210, Sta. B, Montreal, Quebec, Canada
†Brush, George D., 35 E. Gay St., Rm. 418, Columbus 15, Ohio
Brutsche, J. H., Bauer Pottery Co., Inc., 1800 Murphy Ave., S. W., Atlanta, Ga.
Bryant, Eugene E., 75 Cresswell, Bedford, Ohio
Buchanan, J. Ross, Mayer China Co., Beaver Falls, Pa.
Buchholz, Edward R., 1650 East Ave., Rochester 10, N. Y.
Buchholz, Russell A., Bellefield Dwellings, 4400 Center Ave., Pittsburgh 13, Pa.
Buck Glass Co. (R. A. Blunt), Fort Ave. and Lawrence St., Baltimore 30, Md.
†Buck, K. E., Ross-Tacony Crucible Co., Tacony, Philadelphia 35, Pa.
†Buckles, Paul E., 1004 S. Main St., Fostoria, Ohio
†Buckner, O. S., Bay State Abrasive Products Co., Westboro, Mass.
Budnikoff, P. P., Pushkinskaya St. 79, Ufa, U.S.S.R.
Buffalo Pottery, Inc. (R. E. Gould), 1456 Seneca St., Buffalo 10, N. Y.
Bulavin, Ivan A., Volkor Perevlok No. 7–9, Kvartira 36, Moscow 155, U. S. S. R.
Bullock, C. L., Ohio Power Co., 112 West 5th St., East Liverpool, Ohio
Bunce, E. H., Technical Dept., New Jersey Zinc Co. of Pennsylvania, Palmerton, Pa.
*Burch, Oscar G., Owens-Illinois Glass Co., General Research Lab., Box 1035, Toledo 1, Ohio
Burchenal, Charles H., Cambridge Tile Mfg. Co., Box 71, Cincinnati 15, Ohio
*†Burchfiel, Comdr. B. M., Room 716, Security Life Bldg., 810 Fourteenth St., Denver 2, Colo.
Burdett, R. E., American Crucible Co., Shelton, Conn.
Burdick, Sidney D., 6 Belleau St., Corning, N. Y.
*Burgess, Blandford C., Box 395, Spruce Pine, N. C.
Burgner, Arthur J., Canadian Potteries, Ltd., St. Johns, Quebec, Canada
Burke, L. R., 60 N. Harrison Ave., Pittsburgh 2, Pa.
†Burkhalter, Edward, Box 416, R. D. 8, Tacoma, Wash.
Burn, John H., 32, Mosley St., Newcastle-on-Tyne, England
Burnand, Guy M., Messrs. Johnson, Matthey & Co., Ltd., 78, Hatton Garden, London, E. C. 1, England
Burnham, Forrest E., Box 931, Alfred, N. Y.
Burns, Lt. (jg) Frederick L., 501 W. Avery St., Pensacola, Fla.
Burns, Ens. Joseph A. (Student), San Francisco, Calif.
Burroughs, F. H., Star Porcelain Co., Trenton 9, N. J.
Burrows, O. Mason, Highland Ave., Holden, Mass.
Burt, N. P., 400 Fifth Ave., Leavenworth, Kans.
Burt, Roland C., Germantown Manor, Apt. 806, Green and Hartter Sts., Germantown, Philadelphia, Pa.
*Burt, Stanley G. (Charter Life), Box 812, Stuart, Fla.
Bush, James W., 351 Kamback St., Pittsburgh 11, Pa.
Butcher, L. H., Co. (W. D. Schwartz), 2030 Bay St., Los Angeles, Calif.
Butchko, Thomas J. (Student), 138 S. Frazier St., State College, Pa.
Bute, Harold B., 4206 Baring Ave., East Chicago, Ind.
Butler, Pvt. Charles E., Jr. (Student), Tampa, Fla.
Butler, F. W., Akron Porcelain Co., Akron 14, Ohio
Butler, James F., 6129 Lincoln Ave., Pennsauken Township, N. J.
Butler, John, Ceramics Dept., Philadelphia Museum School of Industrial Art, Philadelphia, Pa.
Butler, Louis A., 4th and Canal Sts., Zanesville, Ohio
Butler, Thomas J., Jr., Box 279, Austin 2, Texas

Butler, William F., 3443 Valley Green Dr., Drexel Hill, Pa.
Button, Bland B., Diversey Corp., 53 W. Jackson Blvd., Rm. 950, Chicago 4, Ill.
Buzard, Fred T., Bell St., Plymouth, Ohio

Cable, Davis A., 245 21st Street, N. W., Canton 3, Ohio
Cadwallader, W. W., A. J. Lynch & Co., 2424 Enterprise St., Los Angeles 21, Calif.
†Cahoon, G. J., Knox Porcelain Corp., Knoxville 11, Tenn.
Cahoon, John B., Jr., 1555 E. 3350 South, Salt Lake City 5, Utah
Caine, Frederick W., Brittains Bricks & Pipes Pty., Ltd., Darra, near Brisbane, Queensland, Australia
Caito, Lt. A. M., 246 E. Maynard Ave., Columbus, Ohio
Cala, Charles F., 144 Hoover Rd., Rochester, N. Y.
Caldwell, Smiley, Jr., Rolland Glass Co., Clarksburg, W. Va.
Caldwell, William D., 21 Pearl Dr., Greenlee Village, Brentwood, Pittsburgh 10, Pa.
*†Callahan, H. D., U. S. Quarry Tile Co., East Sparta, Ohio
*†Callinan, Edward E., Standard Steel Works Div., Baldwin Locomotive Works, Burnham, Mifflin County, Pa.
Calton, R. G., Tennessee Enamel Mfg. Co., Park Ave. and Railroad, Nashville 9, Tenn.
Cambridge Glass Co., Cambridge, Ohio
Cameron, A. C., North East Fire Brick Co., North East, Md.
Campbell, Edward S., Northwestern Glass Co., 5801 E. Marginal Way, Seattle 4, Wash.
Campbell, G. Donald, Pittsburgh Plate Glass Co., Clarksburg, W. Va.
Campbell, Ian, California Inst. of Tech., Pasadena 4, Calif.
*†Campbell, Robert M., Alfred, N. Y.
Campbell, Tom W., Box 255, Poland, Ohio
Campbell, Van E., 363 Highland Ave., Wadsworth, Ohio
Campbell, Verle (Student), R. D., Oakfield, N. Y.
Canadian Ceramic Society (L. C. Keith), 49 Turner Rd., Toronto 10, Ontario, Canada
Canfield, J. J., 2909 Orlando Dr., Middletown, Ohio
Canfield, Ruth, Barney Bldg., New York Univ., 9th and Stuyvesant Sts., New York 3, N. Y.
Canton Stamping & Enameling Co., Canton 5, Ohio
Capell, Robert G., Floridin Co., Warren, Pa.
Carborundum Co. (Otis Hutchins), Niagara Falls, N. Y.
*Carder, Frederick (Honorary), Steuben Div., Corning Glass Works, Corning, N. Y.
Carey, J. Sheldon, Dept. of Design, Univ. of Kansas, Lawrence, Kans.
Carlson, C. W., United States Glass Co., Tiffin, Ohio
Carlyle, Edward C., Box 128, Ironton, Ohio
Carnegie-Illinois Steel Corp. (J. C. Eckel), 922 Carnegie Bldg., Pittsburgh 30, Pa.
Carnes, Kenneth C., 2643 Wesleyan Dr., Toledo 9, Ohio
Carnes, Samuel J., Camark Pottery Co., Camden, Ark.
Carothers, R. B., H. C. Spinks Clay Co., Box 256, Newport, Ky.
Carothers, T. E., 4460 Mosher Ave., Los Angeles 31, Calif.
Carr-Lowrey Glass Co. (Norman R. Beck), Box 356, Baltimore 3, Md.
*†Carruthers, John L., Lord Hall, Ohio State Univ., Columbus 10, Ohio
†Carter, F. B., 515 S. Washington St., Tiffin, Ohio
*†Carter, Herbert D., 3351 Dorchester Rd., Shaker Heights 20, Ohio
Carter, Wilber A., Detroit Edison Co., 2000 Second Ave., Detroit 26, Mich.
Cartwright, S. V., Whitacre-Greer Fireproofing Co., Waynesburg, Ohio
Casamo, Charles C., Sylvania Electric Products, Inc., Plant 3, Box 600, Warren, Pa.
Case, V. B., Paper Makers Importing Co., Inc., Drake Bldg., Easton, Pa.
Case, W. A., & Son Mfg. Co. (Willard G. Young), Robinson, Ill.
Casey, John F., Box 1888, Pittsburgh 30, Pa.
Cassel, Hans M., 1230 E. Front St., Plainfield, N. J.
Caton, Albert J., Jr., 227 Clay St., Reno, Nev.
Caton, Milton W., 22490 Nevada Ave., East Detroit, Mich.
Cawood, Richard L., East Liverpool, Ohio
Cayford, James M., Glascote Products, Inc., 20900 St. Clair Ave., Cleveland, Ohio
Central Silica Co. (R. G. Hay), Zanesville, Ohio
Ceramic Color & Chemical Mfg. Co. (W. F. Wenning), Box 297, New Brighton, Pa.
Ceramics Publishing Co., Inc. (LeRoy W. Allison), Box 173, Newark, N. J.
*Cermak, Frank, 1542 Union St., Schenectady 8, N. Y.
Certain-teed Products Corp. (S. C. Marshall), 120 S. La Salle St., Chicago 3, Ill.
Chadeyron, A. A. G., Cleveland Magnesite & Refractory Co., Ltd., Normanby Brickworks, Normanby, Middlesbrough, Yorkshire, England
Chaffee, Clare S., 3709 Liberty Blvd., South Gate 1, Calif.
Chamberlain, James M. W., Box 350, Akron 9, Ohio
Chambers, J. Fred, National Gypsum Co., Luckey, Ohio
Chambers, Gordon H., 1609 Summer St., Philadelphia, Pa.
Champion Spark Plug Co. (Frank H. Riddle), Ceramic Div., Butler Ave. and Grand Trunk R.R., Detroit 11, Mich.
Chandler, Harry L., 4340 41st Street, Camden, N. J.
Chantler, L. W., Standard Lime & Stone Co., Millville, W. Va.
Charbonnier, William P., Walsh Refractories Corp., 4070 N. First St., St. Louis 7, Mo.
Charman, Walter M., Ferro Engineering Co., 1208 Hanna Bldg., Cleveland 15, Ohio
Chase, Dana, 360 N. Michigan Ave., Chicago 1, Ill.
Chattanooga Glass Co. (Frank Meacham), Chattanooga 10, Tenn.
Chegin, Hildegard (Student), 3039 Keswick Rd., Cleveland, Ohio
Chesler, I., 710 East 14th St., New York 9, N. Y.
Chester, A. E., Promat Div., Poor & Co., 851 S. Market St., Waukegan, Ill.
Chesters, John H., Central Research Labs., United Steel Co., Stocksbridge, near Sheffield, England
Chicago Hardware Foundry Co. (Robert J. Young), North Chicago, Ill.
Chicago Pottery Co. (J. S. Clifford), 1920 Clybourn Ave., Chicago 14, Ill.
Chicago Retort & Fire Brick Co. (A. H. Taylor), 208 S. La Salle St., Chicago 4, Ill.
Chicago Vitreous Enamel Product Co. (William Hogenson), 1427 South 55th Court, Cicero 50, Ill.
Chilcote, Joseph H., 1907 16th St., N., Arlington, Va.
Child, J. L., Hancock Brick & Tile Co., Findlay, Ohio
Childs, Robert L., 78 Gorton St., Corning, N. Y.
Chisholm, Boyd and White Co. (L. W. Flood), 57th and Wallace Sts., Chicago 21, Ill.
Chormann, O. I., 195 Gregory Hill Rd., Rochester, N. Y.
Christensen, Carl J., Bell Telephone Labs., Murray Hill, N. J.
Christman, Brian B., 344 Mercer St., Butler, Pa.
Christman, C. E., Federal Enameling & Stamping Co., Pittsburgh, Pa.
†Christman, H. M., 1023 Roosevelt, N. E., Massillon, Ohio
Church, Marshall T., 200 Orange Dr., San Antonio 1, Texas
Claffey, Lawrence W., 1 S. East Ave., Vineland, N. J.
Clapham, Charles H., Jr., Rosalind Gardens, Apt. 1-D, Broadway, Dobbs Ferry, N. Y.
*†Clare, R. L., 212 Rector St., Perth Amboy, N. J.
Clark, Alec W., Wombwell Hall, near Barnsley, Yorkshire, England
Clark, C. Burton, 1464 Park Blvd., Apt. 12, Dormont, Pittsburgh 16, Pa.
Clark, Horace N., Refractory & Insulation Corp., 120 Wall St., New York 5, N. Y.
Clark, G. D., Jr., N. Clark & Sons Div., Pacific Clay Products, 401 Pacific Ave., Alameda, Calif.
†Clark, John D., Apt. 213, Jericho Manor, Jenkintown, Pa.

Clark, N., & Sons Div., Pacific Clay Products (G. D. Clark, Jr.), 401 Pacific Ave., Alameda, Calif.
Clark, Orrin H., Corning Glass Works, Corning, N. Y.
†Clark, Roland J., 4016 Hartel St., Philadelphia 36, Pa.
*Clark, William M., 16201 Brewster Rd., East Cleveland 12, Ohio
Clarke, Charles W., Morton, Ill.
Clarke, Ford K., 5557 Beeler St., Pittsburgh 17, Pa.
Clay, Wilfred, Roberts & Manders Stove Co., Hatboro, Pa.
Claycraft Co. (C. Forrest Tefft), Box 866, Columbus 16, Ohio
Clayton & Lambert Mfg. Co. (Charles F. Lambert), 11111 French Rd., Detroit 5, Mich.
Cleghon, Charles C., 535 George St., Clyde, Ohio
†Clemens, Eugene C., Cannelton Sewer Pipe Co., Cannelton, Ind.
Clements, J. A., Shaws Glazed Brick Co., Ltd., Darwen, Lancashire, England
Cleveland Museum of Art, William M. Milliken, Cleveland 6, Ohio
Cleveland, Theodore K., Sixth and Grayson Sts., Berkeley 2, Calif.
Cleverly, William B., Carborundum Co., Ltd., Trafford Park, Manchester, England
Clews, Francis H., Mellor Labs., Shelton, Stoke-on-Trent, England
Clifford, J. S., Chicago Pottery Co., 1920 Clybourn Ave., Chicago 14, Ill.
Cline, I. R., Western Brick Co., Danville, Ill.
†Cline, Robert W., 8 Upton Dr., Kensington, Md.
Cloud, Franklin H. (Student), 482 S. Seigel St., Decatur, Ill.
Coates, Bill, Coates Co., 2721 Guadalupe, Austin 21, Texas
Coen, Bernard, Woodbridge Sanitary Pottery Corp., 500 Green St., Woodbridge, N. J.
†Coffeen, William W., 4820 Drummond Ave., Chevy Chase 15, Md.
Coffer, L. Wallace, Climax Molybdenum Co., Langeloth, Pa.
Coffin, Leon B., West School Lane, Yardley, Pa.
Coffman, William N., Keystone Abrasive Wheel Co., Gregg and Hammond Sts., Carnegie, Pa.
Cogen, Saul, Davidson Brick Co., 4701 Floral Dr., Los Angeles, Calif.
Cohen, Aaron (Student), 446 10th St., E., Prince Albert, Saskatchewan, Canada
Cohen, Arthur, Sylvania Electric Products, Inc., 83–30 Kew Gardens Rd., Kew Gardens, N. Y.
Cohen, Pfc. Irving I. (Student), San Francisco, Calif.
Colbert, William W. (Student), Dept. of Mineral Tech., Pennsylvania State College, State College, Pa.
Cole, G. Percy, Dominion Glass Co., Ltd., Box 190, Montreal, Quebec, Canada
*†Cole, Sandford S., National Lead Co., Titanium Div., Research Lab., Box 58, South Amboy, N. J.
†Coleman, Robert L., 2325 Fulton Ave., Davenport, Iowa
Coleman, Thomas B., 523 Beal St., Rocky Mount, N. C.
Collin, Robert (Student), 980 17th Ave., Minneapolis 14, Minn.
Collins, George F., Jr., Liberty Glass Co., 317 E. Lee, Sapulpa, Okla.
†Collins, Paul F., Austenal Labs., Inc., 5932 Wentworth Ave., Chicago 21, Ill.
Colonial Insulator Co. (R. W. Hemphill), 973 Grant St., Akron 11, Ohio
Columbia Fire Brick Co. (M. L. Hamaker), First National Bank Bldg., Canton 2, Ohio
Comeforo, Jay Eugene (Student), 10 Sanford St., New Brunswick, N. J.
Commercial Decal, Inc. (Alfred Duhrssen), East Liverpool, Ohio
*†Commons, Charles H., Jr., 4621 Terrace Dr., Niagara Falls, N. Y.
Companhia Paulista de Mineração (Eduardo C. Simonsen), Caixa Postal 3008, São Paulo, Brazil
Conard, John B., 508 Woodward Ave., Mansfield, Ohio
Conn, Willi M., 8449 Terrace Dr., El Cerrito, near Richmond, Calif.
Connell, George A., 510 West 6th St., Los Angeles 14, Calif.
Conover, Ray C., Emsco Refractories Co., Lehi, Utah
Consolidated Feldspar Corp. (M. J. McHugh, Jr.), 1403 Trenton Trust Bldg., Trenton 8, N. J.
Cook, Charles S., Cook & Cook, First National Bank Bldg., Concordia, Kans.
*Cook, Herman L., O. Hommel Co., 209 4th Ave., Box 475, Pittsburgh 30, Pa.
Cook, Mary E., St. Anthony's Hospital, 1450 Hawthorne Ave., Columbus 3, Ohio
Cook, Ralph L., 204 Ceramics Bldg., Univ. of Illinois, Urbana, Ill.
Cook, Roy J., 154 Poplar Ave., West Springfield, Mass.
Cook, Wilbur E., Wadsworth Brick & Tile Co., Wadsworth, Ohio
Cooper, Maurice A., Univ. of Witwatersrand, Johannesburg, South Africa
Cooper, William G., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Co-Operative Enameling Co. (Gordon W. Lasiter), 2335 East 67th St., Cleveland, Ohio
Coors Porcelain Co. (A. Coors, Jr.), Golden, Colo.
Coors, A., Jr., Coors Porcelain Co., Golden, Colo.
Copeland, Ralph E., Steubenville Pottery Co., Steubenville, Ohio
†Copp, Warren F., Wheeling Steel Corp., Yorkville, Ohio
Corbin, Juanita M., 569 Raymer Blvd., Toledo 5, Ohio
Corbman, Morriss, 1604 Lincoln St., Bethlehem, Pa.
Corhart Refractories Co., Inc. (Fred S. Thompson), 16th and Lee Sts., Louisville 10, Ky.
Cornelius, Y. R., 13209 3rd Ave., N. W., Seattle 77, Wash.
Corning Glass Works (J. T. Littleton), Corning, N. Y.
Corning Glass Works, Charleroi Plant (A. W. Wishart), Charleroi, Pa.
Cornwell, George L. (Student), 26 Orchard Ave., Blasdell, N. Y.
Cortina, Jaime, Apartado 25 Colonia Industrial, Mexico D. F., Mexico
†Cosby, Lt. A. B., San Francisco, Calif.
*†Coss, H. T., Johns-Manville Research Lab., Manville, N. J.
Coté, A. U., Cooksville Co., Ltd., Cooksville, Ontario, Canada
†Couch, Albert H., Libbey-Owens-Ford Glass Co., Rossford, Ohio
Couch, Everett G., Jr., Charles Taylor Sons Co., Cincinnati 14, Ohio
Courtney, Scott J., B. F. Drakenfeld & Co., Inc., 45–47 Park Place, New York 7, N. Y.
Coutant, Doris J. (Student), Box 60, Highland, N. Y.
Covan, H. E., 396 Mimring Rd., Columbus 2, Ohio
Cowan, Carolyn A., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Cowan, J. G., "Roselands," Billington, Haughton, Staffordshire, England
Cowell, J. Robert, Jr., Woodville Lime Products Co., 2140 Jefferson Ave., Toledo, Ohio
*Cox, Paul E., Abrasive Co., Tacony and Fraley Sts., Philadelphia 37, Pa.
Cox, R. O., Day-Brite Lighting, Inc., 5411 Bulwer Ave., St. Louis, Mo.
Cox, Samuel F., Pittsburgh Plate Glass Co., Research Lab., Creighton, Pa.
Cox, Shaun M., J. A. Jobling & Co., Ltd., Wear Glass Works, Sunderland, Co. of Durham, England
Craig, James E., 1055 Allison Ave., Washington, Pa.
Craig, James W., Canadian Refractories, Ltd., 1050 Canada Cement Bldg., Montreal, Quebec, Canada
Cramer, Tressa H. (Student), 1905 Van Ness Ave., San Francisco 9, Calif.
†Cramer, W. E., 965 West 5th Ave., Columbus 8, Ohio
†Crandall, Eugene R., 30 Pearl Hill, Milford, Conn.
†Crandall, James R., Central Res. Labs., American Smelting & Refining Co., Barber, N. J.

Crandon, A. S., American Window Glass Co., 16th Floor, Farmers Bank Bldg., Pittsburgh 22, Pa.
Crane Enamelware Co., Chattanooga, Tenn.
Crane, Robert F., 505 Glendale Blvd., Parchment, Mich.
Craver, Howard H., Pittsburgh Testing Lab., Stevenson and Locust Sts., Pittsburgh 19, Pa.
*†Crawford, George E., 406 Belmont Ave., Haddonfield, N. J.
Crawford, J. C., Jr., Johns-Manville Sales Corp., 22 East 40th St., New York 16, N. Y.
†Crawford, J. L., Walsh Refractories Corp., 4070 North 1st Street, St. Louis 7, Mo.
Creamer, Ansel S., National Bureau of Standards, Washington 25, D. C.
Cress, William C., Carolina Ceramics, Inc., Box 1257, Columbia, S. C.
Crew, J. A., Masonic Temple, Zanesville, Ohio
Crockett, William E., 1224 Barber, Apt. 4, Little Rock, Ark.
Cromer, George W., 2307 N. Calvert St., Baltimore 18, Md.
Cronin China Co. (W. K. Cronin), Minerva, Ohio
Cronin, W. Kress, Cronin China Co., Minerva, Ohio
Crooks, Guy E., Crooksville China Co., Crooksville, Ohio
Crookston, James, c/o D. Morette, Benld, Ill.
Crooksville China Co. (Guy E. Crooks), Crooksville, Ohio
Croskey, Carl D., 822 Braeside Rd., Baltimore 29, Md.
†Cross, Owen H., Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio
Crossley Machine Co. (William J. Harris), Trenton 9, N. J.
Crowley, Francis J., W. B. Lawson, Inc., 877 Union Commerce Bldg., Cleveland 14, Ohio
Crowley, Henry L., 1 Central Ave., West Orange, N. J.
Crown Potteries Co. (J. P. Wendt), Evansville 7, Ind.
Cruciana, F. L., Box 748, R. D. 1, Freedom, Pa.
Cruikshank, C. L., Great Lakes Foundry Sand Co., 720 United Artists Bldg., Detroit 26, Mich.
Crumbaker, H. G., Lancaster Lens Co., 220–226 W. Main St., Lancaster, Ohio
Crunden Martin Mfg. Co. (E. A. Schwarz), 760 South 2nd St., St. Louis 2, Mo.
Cullinan, Roland V., P. O. Olifantsfontein, Transvaal, South Africa
Cummings, G. R., Viking Glass Co., New Martinsville, W. Va.
Cunliffe, B. A., Medalta Sales B. C. Reg'd., 29 W. Pender St., Vancouver, British Columbia, Canada
Cunningham, Eugene E., Greenfield Ave., R. D. 2, Newark, Ohio
Curll, Daniel B., Jr., Rumford Chemical Works, Rumford 16, R. I.
Currier, O. L., Leonard Refrigerator Co., Grand Rapids, Mich.
Curtis Laboratories, Inc. (T. S. Curtis), 2718 Griffith Park Blvd., Los Angeles 27, Calif.
Curtis, A. B., Johns-Manville Corp., 1530 Guild Hall Bldg., 45 Prospect Ave., N. W., Cleveland 15, Ohio
Curtis, Algernon L., Westmoor Lab., London Rd., Chatteris, England
Curtis, Carl E., Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
*Curtis, Thomas S., 2718 Griffith Park Blvd., Los Angeles 27, Calif.
†Curtis, Wesley E., Box 503, Woods Hole, Mass.
Curtis, W. F., Fostoria Glass Co., Moundsville, W. Va.
Curts, R. M., American Potash & Chemical Corp., 122 East 42nd St., New York 17, N. Y.
Czechoslovak Ceramic Society, R. Barta, Prague II, 1588, Czechoslovakia
Czolgos, Edmund P., Century Vitreous Enamel Co., 6641 S. Narragansett Ave., Chicago, Ill.

Dafoe, Mrs. Grace B. (Student), 77 Bowling Dr., Oakland 11, Calif.
†Dager, Probert W., Southern California Ceramic Co., 1741 Clover Field Blvd., Santa Monica, Calif.
Dahlquist, Hugo A., Woodland Rd., Holden, Mass.
Dailey, E. W., 917 Walnut St., Chillicothe, Mo.
Dalton, Robert H., 234 Delevan Ave., Corning, N. Y.
Dammann, Richard (Student), 11 Anita Place, Amityville, N. Y.
Daniel, George R., 1535 South 5th St., Ironton, Ohio
*†Danielson, R. R., Metal & Thermit Corp., Carteret, N. J.
Danks, William H., 216 Mississippi Ave., Crystal City, Mo.
Dantzler, M. A., Rundle Mfg. Co., 3305 W. Forest Home Ave., Milwaukee 7, Wis.
Darby, George M., 61 Washington Ave., Westport, Conn.
Darrah, W. A., 901 N. Oak Park Blvd., Oak Park, Ill.
Daumke, Arthur H., 3629 N. Paulina St., Chicago 13, Ill.
Davey, Earl R., Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario, Canada
Davies, Edward G., Dominion Glass Co., Ltd., Wallaceburg, Ontario, Canada
†Davies, Chester A., 7½ Bailey Ave., Montpelier, Vt.
Davies, George S., Inland Fire Brick Co., 3120 Berea Rd. at Elmwood Ave., Cleveland 11, Ohio
Davis Fire Brick Co. (D. D. Davis), Oak Hill, Ohio
Davis, D. D., Davis Fire Brick Co., Oak Hill, Ohio
*†Davis, Harry E., Universal Potteries, Inc., Cambridge, Ohio
Davis, H. M., Mineral Industries Bldg., State College, Pa.
Davis, H. S., Portsmouth Clay Products Co., Inc., Portsmouth, Ohio
Davis, James K., 26 East 3rd St., Corning, N. Y.
Davis, N. B., Rm. 512, 140 Wellington St., Ottawa, Ontario, Canada
Davison, Albert W., 1119 Moundview Ave., Newark, Ohio
Day, Arthur L. (Honorary), 9113 Old Georgetown Rd., Bethesda, Md.
Day, Charles M., 208 N. Broadway, St. Louis, Mo.
Day, Frank, Jr., Corning Glass Works, Corning, N. Y.
†Day, Jack F., 1901 Dresden Rd., Zanesville, Ohio
†Day, Ralph K., 307 W. Harrison Ave., Maumee, Ohio
Deaderick, James W., American Lava Corp., Chattanooga 5, Tenn.
Dean, Homer, 9 Forest Court, Knoxville 16, Tenn.
*†Dear, Paul S., Box 205, Blacksburg, Va.
DeBeck, Hubert O., Custer Non-Metallics, Custer, S. D.
†Debenham, William S., Carnegie-Illinois Steel Corp., 208 S. La Salle St., Chicago 90, Ill.
Decker, Alfred R., 10814 McKinney Ave., Detroit 24, Mich.
Dedouch, J. A., 910 Keystone Ave., River Forest, Ill.
Deeds, C. L., Homer Laughlin China Co., Newell, W. Va.
Deegan, Joseph E., 3804 Maple St., Progress, Pa.
Deeth, H. R., American Nepheline Corp., Rochester 12, N. Y.
Deible, Clarence R., Marienville Glass Co., Marienville, Pa.
Delgado, Cyril B., 55 West 42nd St., New York 18, N. Y.
Demaison, R. J., Quigley Co., Inc., 527 Fifth Ave., New York 17, N. Y.
Demuth Glass Works, Inc., Parkersburg Div., Box 629, Parkersburg, W. Va.
Denison Engineering Co. (W. C. Denison, Jr.), 1160 Dublin Rd., Columbus 16, Ohio
Deneen, W. F., North Carolina Feldspar Corp., Erwin, Tenn.
*Denison, George W., Ohio Clay Co., Box 1776, Cleveland 5, Ohio
Denison, W. C., Jr., R. D. 1, Powell, Ohio
Denny, Katherine E. (Student), 1407 East 45, Seattle 5, Wash.
Denver Sewer Pipe & Clay Co. (W. J. Geddes), Box 2329, Denver, Colo.
DePaolis, Paul F., 150 Longacre Rd., Rochester 5, N. Y.
Derge, Gerhard, Carnegie Inst. of Tech., Pittsburgh 13, Pa.
Deringer, W. A., 1913 E. Olive St., Milwaukee 11, Wis.
†Derrer, Charles F., Jr., 11 Forest Ave., Elm Grove, Wheeling, W. Va.
†Desaix, Herbert A., 320 East 7th St., Plainfield, N. J.
Deutsch, Eugene J., 923 N. La Salle St., Chicago 10, Ill.

Deutsche Glastechnische Gesellschaft, H. Maurach, Gutletustrasse 8, Frankfurt, A. main, Germany
Deutsche Keramische Gesellschaft, Mr. Knauf, Weglystr 1, Berlin, N. W. 87, Germany
DeVilbiss Co. (E. F. Frey), Toledo 1, Ohio
DeVoe, Charles F., 148 High Rd., Corning, N. Y.
Dewey, B. F., 42 Summit St., LeRoy, N. Y.
Dexheimer, E. C., Box 6, Granite City, Ill.
Diack, George H., North American Refractories Co., Lock Haven, Pa.
Diamond Alkali Co. (L. T. Welshans), Development Div., Painesville, Ohio
Diamond Glass Co. (J. R. Hanson), Royersford, Pa.
*†Diamond, Grant S., 76 Rosedale Ave., Hamburg, N. Y.
Diaz, Efren, Apartado Nacional 475, Bogotá, Colombia
Dickens, H. A., Nilcrom Porcelains (Australia) Pty., Ltd., 221 Separation St., Northcote, Victoria, Australia
Dietert, Harry W., 9330 Roselawn Ave., Detroit 4, Mich.
Dietrich, Waldemar F., Box 397, Capitola, Calif.
Diffendaffer, J. A., General Electric X-Ray Corp., 2012 W. Jackson Blvd., Chicago 12, Ill.
Dilaura, Ens. Francis J. (Student), Bainbridge, Md.
Dillingham, H. L., American Glassware Assn., 19 West 44th St., New York 18, N. Y.
Dillon, B. F., 434 Laurel Blvd., New Castle, Pa.
Dingledine, H. F., National Sewer Pipe Co., Ltd., Wentworth St., N., Hamilton, Ontario, Canada
Dingledy, David, 165 Columbia St., Corning, N. Y.
Dingwall, Andrew, 133 Front St., New York 5, N. Y.
Dippell, L. V., 17 Second Ave., Tiffin, Ohio
Dirats, J., & Co., Inc. (J. Dirats), Notre Dame St., Westfield, Mass.
Dirats, J., J. Dirats & Co., Inc., Notre Dame St., Westfield, Mass.
Distillers Corporation, Ltd. (Adalbert Herman), 1430 Peel St., Montreal, Quebec, Canada
Dixon, Anna Lane, 815 North 4th St., Burlington, Iowa
Dixon, Fred W., Jr., 321 N. Central Ave., Chicago 44, Ill.
Dixon, Joseph, Crucible Co. (H. P. Smith), Jersey City 3, N. J.
Dobrovolny, Frank J., E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Niagara Falls, N. Y.
Dodd, Arthur E., Mellor Labs., Shelton, Stoke-on-Trent, England
*†Dodd, Charles M., Dept. of Ceramic Engr., Iowa State College, Ames, Iowa
Dodge, Alfred W., Hazel-Atlas Glass Co., 126 Market St., Zanesville, Ohio
Doidge, Russell M., Morgan Crucible Co., Ltd., Battersea Works, Church Rd., London, S. W. 11, England
Doll, Charles E., Mount Clemens Pottery Co., Mount Clemens, Mich.
Dominion Minerals, Inc. (V. V. Kelsey), Piney River, Va.
Donen, I., Pretoria Glass Works, Box 863, Pretoria, South Africa
Doney, Louis M., Sylvania Electric Products, Inc., Emporium, Pa.
Donnenwirth, A. L., Carborundum Co., Niagara Falls, N. Y.
†Doran, Robert, 23 Cunningham Ave., Floral Park, Long Island, N. Y.
†Dornbach, W. E., 706 Edgewood Rd., San Mateo, Calif.
Dorsett, O. A., Knox Porcelain Corp., Knoxville, Tenn.
Dorsey, Baird L., 6625½ Church Ave., Pittsburgh 2, Pa.
Dorsey, Vernon M., Dorsey & Cole, 1346 F St., N. W., Washington, D. C.
Doty, Henry S., American Rutile Corp., 120 Broadway, New York 5, N. Y.
Dougan, Charles W., c/o P. A. Pedersen, R.D. 2, Hamilton, Mont.
Dougherty, Leon A., Box 712, Sun Prairie, Wis.
Dougherty, W. E., 53 N. Emily St., Pittsburgh 5, Pa.
Douglas, Freeman S., Babcock & Wilcox Co., Box 923, Augusta, Ga.
Douglas, John, Co. (John F. Douglas), Cincinnati 16, Ohio
Douglas, John F., John Douglas Co., Cincinnati 16, Ohio
Dows, Robert H., 33 Washington St., Hornell, N. Y.
Drake, Arthur D., 243 W. North Ave., East Palestine, Ohio
Drake, John L., Libbey-Owens-Ford Glass Co., 1701 E. Broadway, Toledo 5, Ohio
Drakenfeld, B. F., & Co., Inc. (Scott J. Courtney), 45–47 Park Place, New York 7, N. Y.
Draker, Harry C., 13614 Fourth Ave., East Cleveland 12, Ohio
Drayton, W. J., Sunshine Porcelain Potteries Pty., Ltd., Sunshine, Melbourne, Australia
*†Dressler, Philip, Swindell-Dressler Corp., Box 1888, Pittsburgh 30, Pa.
*†DuBois, H. B., Consolidated Feldspar Corp., 1403 Trenton Trust Bldg., Trenton 8, N. J.
Duevel, Charles O., Jr., American Thermos Bottle Co., Norwich, Conn.
Duhrssen, Alfred, Commercial Decal, Inc., East Liverpool, Ohio
Dunbeck, N. J., Eastern Clay Products, Inc., Eifort, Ohio
Duncan & Miller Glass Co. (James E. Duncan, 3rd), Washington, Pa.
Duncan, James E., 3rd, Duncan & Miller Glass Co., Washington, Pa.
Duncan, J. Earle, 1004 Oregon Ave., Tarentum, Pa.
Duncan, Russell F., 2122 Russell Ave., Parma 9, Ohio
*Duncombe, George H., Jr., 150 E. Frambes Ave., Columbus 1, Ohio
Dunn, H. E., Vanadium Corp. of America, Bridgeville, Pa.
Duplin, Victor J., Jr., 300 North Ave., Fanwood, N. J.
Du Pont, E. I., de Nemours & Co., Inc. (S. C. Harris), Electrochemicals Dept., Wilmington, Del.
Durbin, Edmund A., 266 E. Torrence Rd., Columbus 2, Ohio
Durgin, Charles B., Monsanto Chemical Co., Anniston, Ala.
Dyer, Mrs. A. R., 1644 Elberon Ave., East Cleveland 12, Ohio

*†Eagle, J. Eugene, 6306 20th Ave., Green Meadows, Hyattsville, Md.
Eames, William J. (Student), Alfred Univ., Alfred, N. Y.
Early, Joseph W., Early Foundry Co., Dickson City, Pa.
†Easter, George J., 2434 South Ave., Niagara Falls, N. Y.
Easterby, E. D., Laurens Glass Works, Inc., Laurens, S. C.
Eastern Clay Products, Inc. (N. J. Dunbeck), Eifort, Ohio
Eastman Kodak Co., Research Library, Kodak Park Works, Rochester 4, N. Y.
Eatherton, C. Z., 861 Center St., Manhattan Beach, Calif.
Echavarria, Norman, Loceria Colombiana, Medellin, Colombia
Eckel, J. C., Carnegie-Illinois Steel Corp., 922 Carnegie Bldg., Pittsburgh 30, Pa.
Eckert, E. W., Westinghouse Electric Corp., Constr. Dept., Maloney Bldg., Pittsburgh 22, Pa.
Eddy, Maxson A., Kimble Glass Co., Vineland, N. J.
Edgar Plastic Kaolin Co. (Albert C. Edgar), Metuchen, N. J.
Edgar, Albert C., Edgar Plastic Kaolin Co., Metuchen, N. J.
Edwards, F. M., Porcelain Products, Inc., Carey, Ohio
Eggleston, Myron M., Alamo Pottery, Inc., 2150 Frio City Rd., San Antonio 7, Texas
Ehlers, Alfred W. G., 100 Belsize Rd., London, N. W. 6, England
Ehlers, G. Milton, 2206 E. Kensington Blvd., Milwaukee 11, Wis.
Ehman, Roy G., 1017 Carlisle St., Natrona Heights, Tarentum, Pa.
Eide, Alwin C., American Zinc Sales Co., Box 327, Columbus 16, Ohio
Eilers, H. F., 162 Watauga Ave., Corning, N. Y.
Ekholm, L. G., 929 Franklin St., McKeesport, Pa.
Elder, J. C., Robertson Mfg. Co., Box 848, Trenton 5, N. J.
Electric Auto-Lite Co., Spark Plug Div. (Robert Twells), Box 231, Fostoria, Ohio
Electro Refractories & Alloys Corp. (Grant S. Diamond), 344 Delaware Ave., Buffalo 2, N. Y.

Ellefson, Bennett S., Sylvania Electric Products, Inc., 208–20 Cross Island Parkway, Bayside, Long Island, N. Y.
Elliott, A. W., Covered Wagon Ranch, Cloverdale, Calif.
Elliott, F. R., 2821 Iowa Ave., Granite City, Ill.
Elliott, George, The Redlands, Ibstock near Leicester, England
Elliott, William S., Dept. of Public Works, Municipal Bldg., New York, N. Y.
Ellis, Richard B., 168 Cedar St., Corning, N. Y.
Ellis, Wilson H., Ceramic Dept., R. T. Vanderbilt Co., Inc., East Norwalk, Conn.
Ellison, Henry W., 12 E. Third St., Corning, N. Y.
Ellison, R. W., Vitrefrax Corp., 5050 Pacific Blvd., Los Angeles 11, Calif.
Ellsworth, E. J., Sierra Talc Co., 724 S. Spring St., Rm. 1320, Los Angeles 14, Calif.
Elmer, Helen L., 157 W. Pulteney St., Corning, N. Y.
Elmer, Thomas H., 157 W. Pulteney St., Corning, N. Y.
Elosua, Bernardo, Apartado 360, Monterrey, N. L., Mexico
Ely, William G., Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa.
Emanuel, E. C., Armstrong Cork Co., Research Labs., Lancaster, Pa.
Emerson, G. S., Hampden Grinding Wheel Co., 118 Fisk Ave., Springfield 7, Mass.
Emison, M. Hershel, Corning Glass Works, Charleroi Div., Charleroi, Pa.
Emley, William S., 303 Englewood Ave., New Castle, Pa.
†Emrich, Emerson W., R. T. Vanderbilt Labs., East Norwalk, Conn.
Endler, A. H., 15715 Paseo Del Campo, San Lorenzo, Calif.
Engelhard, Charles, Inc. (A. W. Taber), 90 Chestnut St., Newark, N. J.
Engle, Chester C., United Clay Mines Corp., Trenton 6, N. J.
English China Clay Sales Corp., 551 Fifth Ave., New York 17, N. Y.
Engstrom, A. H., Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia 47, Pa.
Epsten, Lt. (jg) Stephen H. (Student), San Francisco, Calif.
Erickson, A. Alfred, 80 Pershing St., Corning, N. Y.
Erickson, Allen J. (Student), 4741 35th, N. E., Seattle, Wash.
Erie Resistor Corp. (Byron B. Minnium), 644 West 12th St., Erie, Pa.
Ernst, Louis, Louisville Fire Brick Works, 4554 Louisville Ave., Louisville 9, Ky.
Erskine Glass & Mfg. Co. (W. S. Erskine), Wellsburg, W. Va.
Erskine, W. S., Erskine Glass & Mfg. Co., Wellsburg, W. Va.
Erwin, Howard R., 8141 San Miguel, South Gate, Calif.
Espinosa, Miguel (Student), Garcia Moreno 45, Quito, Ecuador
Esrey, Wallace M., R.D. 2, Box 171, Pittsburg, Calif.
Esselstyn, Willard A., 1214 Investment Bldg., Pittsburgh 22, Pa.
Essick, Charles R., 700 Centre Ave., Reading, Pa.
Etheredge, Otis K., Box 252, Gordon, Ga.
Etherington, Alfred G., Sovereign Potters, Ltd., Hamilton, Ontario, Canada
Eubank, William R., Portland Cement Assn., National Bureau of Standards, Washington, D. C.
Eureka Flint & Spar Co. (Herreld D. Thropp), Box 266, Trenton 2, N. J.
Eusner, George R., 319 Spruce St., Latrobe, Pa.
Euston, Jacob H., 79 W. Monroe St., Chicago 3, Ill.
Evans Lead Corp. (R. M. Evans), Box 1467, Charleston 25, W. Va.
Evans, Charles E., 222 16th Avenue, Columbus, Ohio
Evans, Daniel O., Hillcrest and Linden Aves., Mapleview, Charleroi, Pa.
Evans, R. L., George L. Ashworth & Brothers, Ltd., Broad St. Works, Hanley, Stoke-on-Trent, England
Evans, R. M., Evans Lead Corp., Box 1467, Charleston 25, W. Va.
Evans, Richard F., 2300 Orange Cove, La Crescenta, Calif.
Evans, Robert E., 4320 Chester Dr., Youngstown 7, Ohio
Evans, Ross M., 604 E. Mechanic St., Brazil, Ind.
*†Everhart, J. O., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Ewertz, Henry, 53 Albert Ave., Aldan, Clifton Heights, Pa.
Exolon Co. (William A. Harty), Tonawanda, N. Y.
†Eyerly, George B., c/o William H. Eyerly, Jr., 382 W. Pine St., Canton, Ill.

*†Fabianic, William L., 1831 Seminary Ave., Alton, Ill.
Fabrica de Ladrillos Industriales y Refractarios, S. A. (Odriozola Gomez, Salvador), Apartado 390, Monterrey, N. L., Mexico
*Fackt, George P., Box 936, Palos Verdes Estates, Calif.
†Fahrenbruck, William O., R.D. 1, Box 95, Tiffin, Ohio
Failmezger, Howard, 96 Colonial Village Rd., Rochester 10, N. Y.
Fairchild, Charles O., C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn 5, N. Y.
Fairfacts Company, Inc. (M. P. Mitchell), Box 374, Trenton 3, N. J.
Falcao, Eric R., Caixa Postal 1448, Rio de Janeiro, Brazil
Falconer, Donald P., 45–15 Vernon Blvd., Long Island City 1, N. Y.
Falknor, Tom, Edgar Brothers Co., McIntyre, Ga.
Fallon, Frank J., 1085 Tuxedo Sq., Teaneck, N. J.
Falter, Arthur H., 8635 Jacob Place, Niagara Falls, N. Y.
Farncomb, Frederick J., 180 Princeton Ave., Corning, N. Y.
*Farnham, Dwight T., Green Orchard, Compo Rd., Westport, Conn.
Farren, Mabel C., 667 S. Carondolet, Los Angeles, Calif.
Faulkner, Karl B., Corning Glass Works, Corning, N. Y.
Faulkner, Richard (Student), 263 Grand St., New York, N. Y.
Faust, George T., 1803 Capitol View Ave., Silver Spring, Md.
Faust, William A. (Student), Linde Air Products Co., East Park Dr. and Woodward Ave., Tonawanda, N. Y.
†Fay, Mervin A., 916 E St., Sparrows Point 19, Md.
Federal Glass Co. (Henry H. Blau), 515 E. Innis Ave., Columbus 7, Ohio
Federal Seaboard Terra Cotta Corp. (O. E. Mathiasen), Perth Amboy, N. J.
Fedock, Michael P., 1026 Market Ave., N., Canton 4, Ohio
*†Fellows, R. L., 748 N. Kensington Ave., La Grange, Ill.
†Fels, C. G., 70 Catalpa Ave., Perth Amboy, N. J.
Fenner, Alice C., Cranston Fenner Studio, New Preston, Conn.
Fenton Art Glass Co. (F. M. Fenton), Williamstown, W. Va.
Fenton, F. M., Fenton Art Glass Co., Williamstown, W. Va.
Fenton, Walter M., Metalloy Corp., 1320 Rand Tower, Minneapolis 2, Minn.
Ferdinand, George, 750 N. Euclid Ave., Ontario, Calif.
Ferguson, J. N., 160 E. Fourth St., Corning, N. Y.
Ferguson, Robert F., 936 Blue Ave., Zanesville, Ohio
Ferguson, R. L., 730 Stuart Bldg., Lincoln 8, Neb.
Ferguson, R. W., Star Porcelain Co., Muirhead Ave., Trenton 9, N. J.
Ferrelly, Frank, Calicut, Malabar, South India
Ferro Enamel Corp. (R. A. Weaver), 4150 East 56th St., Cleveland 5, Ohio
Ferro Enamels (Australia) Pty., Ltd. (R. M. Mueller), Bourke Rd., Alexandria, N.S.W., Australia
Ferro Engineering Co. (Walter M. Charman), 1208 Hanna Bldg., Cleveland 15, Ohio
Ferrosmalt, S. A. (Antonio Orlando), Avenida 18, Julio 1202, Montevideo, Uruguay
Fervier, A. F., Eagle Mfg. Co., Wellsburg, W. Va.
*†Fessler, A. H., Fenton, Mich.
Fettke, Charles R., 1118 Wightman St., Pittsburgh 17, Pa.
Fiberglas Canada, Ltd., Oshawa, Ontario, Canada

Field, Theodore E., 16th and Lee Sts., Louisville 10, Ky.
Fields, W. H., 405 Catherine St., Joliet, Ill.
*Filippi, Hugo, 228 N. La Salle St., Chicago 1, Ill.
Finch, Katherine S., Kay Finch Ceramics, 121 Coast Highway, Corona Del Mar, Calif.
Findlay Clay Products Co. (John L. Leech), Washington, Pa.
Finlayson, K. G., 1334 West 68th St., Los Angeles 44, Calif.
Fischer, Eugene H., Masonic Apt. 2A, Latrobe, Pa.
Fischer, Kermit, R. D. 1, Doylestown, Pa.
Fisher, Helen, 229 Highland Way, Laguna Beach, Calif.
Fisher, Henry C., 1 New Bond St., Worcester 6, Mass.
Fisher, Joseph R., Bell Telephone Labs., Murray Hill, N. J.
Fisher, Victor, 139 West 72nd St., New York, N. Y.
Fisher, W. V., Anchor Hocking Glass Corp., Lancaster, Ohio
Fisk, David, 225 Fifth Ave., New York, N. Y.
†Fisk, Henry G., Science Hall, Univ. of Wyoming, Laramie, Wyo.
†Fitzgerald, Alex E., A4-Avon Apts., Narberth, Pa.
Fitzgerald, John V., 316 East 2nd St., Corning, N. Y.
Fix, Frank A., Lancaster Iron Works, Inc., Lancaster, Pa.
Flannigan, Alice M., 443 Richmond Ave., Buffalo, N. Y.
Fleck, E. M., Vitro Mfg. Co., Corliss Sta., Pittsburgh 4, Pa.
Fleischer, Arthur, 15 Westbourne Parkway, Hartford 5, Conn.
Fleming, A. P. M., Metropolitan Vickers Electrical Co., Trafford Park, Manchester 17, England
Fletcher Enamel Co. (J. Carroll Fletcher), Dunbar, W. Va.
Fletcher, J. Carroll, Fletcher Enamel Co., Dunbar, W. Va.
Flick, Fulton B., 1706 First National Bank Bldg., Pittsburgh, Pa.
*†Flint, Francis C., Hazel-Atlas Glass Co., 319 S. Main St., Washington, Pa.
Flittner, Eleanor (Student), 400 West 31st Street, Los Angeles 7, Calif.
Flood, L. W., Chisholm, Boyd & White Co., 57th and Wallace Sts., Chicago 21, Ill.
Florence, Jack M., 6819 Kindred St., Philadelphia 24, Pa.
Flory, Arthur L. (Student), Alfred, N. Y.
Flowers, E. B., 811 Drewry St., N. E., Atlanta, Ga.
Flu, Eldon B., 1533 Crooks Rd., Royal Oak, Mich.
Fogelberg, Sven, Webb's Crystal Glass Co., Ltd., Dennis Glassworks, Stourbridge, England
Foglesong, Howard D., 722 14th St., Box 432, Huntington, W. Va.
Foote Mineral Co. (H. C. Meyer), 1609 Summer St., Philadelphia 3, Pa.
†Foote, Earl H., Jr., Box 1092, Charleston 24, W. Va.
Foote, Paul C., 714 Prospect Ave., Lake Bluff, Ill.
†Ford, George D., 2136 Wilmer St., Zanesville, Ohio
Ford, George E., A. P. Green Fire Brick Co., 50 Church St., New York 7, N. Y.
Ford, James W., 78 Chateau Terrace, Snyder, Buffalo 21, N. Y.
Ford, W. B., Smith & Stone, Ltd., Georgetown, Ontario, Canada
†Ford, Walter D., 219 Maple St., Port Allegany, Pa.
Fords Porcelain Works (I. A. Hansen), Perth Amboy, N. J.
Foresman, Grover C., 220 Cedar St., Corning, N. Y.
Forester, W. G., Box 974, Trenton 6, N. J.
Forjaz, Nicolau, Porto Ferreira, C.P., CE. São Paulo, Brazil
Forman, L. P., Delaware Apts., Oakmont, Pa.
Forse, Edwin B., Carborundum Co., Box 248, Perth Amboy, N. J.
Forter, Samuel A., Forter-Teichmann Co., 610 Smithfield St., Pittsburgh 22, Pa.
*Fosdick, Marion L., N. Y. State College of Ceramics, Alfred, N. Y.
Foster-Forbes Glass Co. (F. R. Motsch), Marion, Ind.
†Foster, Harry D., 3116 Rodman St., N. W., Washington 8, D. C.
Foster, John A., Bergen Precision Castings, Inc., Pleasantville, N. Y.
Foster, Wilfrid R., Champion Spark Plug Co., Ceramic Div., 8525 Butler Ave., Detroit 11, Mich.
Fostoria Glass Co. (W. F. Curtis), Moundsville, W. Va.
Fox, Eli, 59 Washington St., Dorchester, Mass.
Frahme, Herman H., Dogwood Lane, Union Village, R.D., Scotch Plains, N. J.
Francis, Marcus, British Pottery Research Assn., Stoke-on-Trent, England
†Francisco, Allen C., c/o N. W. Fredericks, Jr., 104 W. Main St., Lock Haven, Pa.
Franck, Charles, Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y.
Frank, John N., Sapulpa, Okla.
Franklin Glass Corp. (A. L. Pasquier), Box 150, Butler, Pa.
Frantz, Samuel G., 161 Grand St., New York 13, N. Y.
Franz, Hemming, Johnson, Vt.
Franz, Leo J., Acme Brick Co., Malvern, Ark.
Fraser, Walter A., Perkin-Elmer Corp., Glenbrook, Conn.
Fraser, W. B., Box 144, Dallas 1, Texas
Frazier-Simplex, Inc. (C. E. Frazier), 436 E. Beau St., Washington, Pa.
*Frazier, C. E., Frazier-Simplex, Inc., 436 E. Beau St., Washington, Pa.
Frazier, C. T., 527 E. Beau St., Washington, Pa.
*†Frazier, J. Earl, Frazier-Simplex, Inc., 436 E. Beau St., Washington, Pa.
*Fréchette, Howells, Bureau of Mines, Ottawa, Ontario, Canada
†Fréchette, Van Derck, N. Y. State College of Ceramics, Alfred, N. Y.
Frederick, Gilbert M., Babcock & Wilcox Co., Packard Bldg., Philadelphia 2, Pa.
Frederick, Thomas J., 100 Watkins Ave., Latrobe, Pa.
Frederick, Vernon W., Libbey-Owens-Ford Glass Co., Rossford, Ohio
Fredericksburg Art Pottery Co. (James McLane), Fredericksburg, Ohio
Freed, Lt. (jg) Harold (Student), San Francisco, Calif.
†Freeman, Charles A., A. P. Green Fire Brick Co., Mexico, Mo.
Freeman, H. S., Square D Co., 6060 Rivard St., Detroit 11, Mich.
Freeman, Joseph, 3012 Germantown Ave., Philadelphia, Pa.
Freese, H. H., E. M. Freese & Co., Galion, Ohio
Freitas, Lafayette de, Industria Brasileira de Artigos Refratarios S/A, Rua Marconi 23, 6° andar, sala 1 e 2, São Paulo, Brazil
French Saxon China Co. (W. V. Oliver), Sebring, Ohio
*French, Myrtle M., 8301 S. Langley Ave., Chicago 19, Ill.
†French, Preston W., 200 Milliken Rd., Pittsburgh 21, Pa.
Frey, E. F., DeVilbiss Co., Toledo 1, Ohio
Friedman, Louis K., 1320 Bennington Ave., Squirrel Hill Sta., Pittsburgh, Pa.
*†Fritz, E. H., 710 Walnut St., Latrobe, Pa.
Fromer, Charles H., Oak Hill, Ohio
Frost, Leon J., Box 138, Lewiston, N. Y.
Fry, Herbert G., National Enamels, Ltd., 53, Norman Rd., Greenwich, London, S. E. 10, England
Fuenzalida, Javier H. (Student), Corporacion De Fomento, 120 Broadway, New York 5, N. Y.
*Fulcher, Gordon S., 3647 Van Ness St., Washington 8, D. C.
†Fuller, Donald H., Quality Porcelain Enamel Mfg. Corp., 228 Lalor St., Trenton 10, N. J.
Fulmer, Raymond C., 332 Center St., St. Marys, Pa.
Fulper Pottery Co. (J. M. Stangl), Trenton 4, N. J.
*†Fulton, C. E., Pittsburgh Plate Glass Co., Creighton, Pa.
Fulton, Glen B., Alliance Porcelain Products Co., Alliance, Ohio
Funkhouser Co. (E. H. Nichols), 138 W. Washington St., Hagerstown, Md.
Funnell, Ens. John E., San Francisco, Calif.
Fyfe, Charles W., Mullite Refractories Co., Shelton, Conn.

Gadd, Harry A., Canadian General Electric Co., Ltd., Peterborough, Ontario, Canada
Gaffney, Robert F. (Student), Box 54, Alfred, N. Y.

Gagnon, R. A., E. I. du Pont de Nemours & Co., Inc., Newport, Del.
Gaines, J. M., Linde Air Products Co., East Park Dr. and Woodward Ave., Tonawanda, N. Y.
†Galbraith, Robert, E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Wilmington, Del.
Galbreath, William W., Jr., Massachusetts Inst. of Tech., Box 551, Cambridge 39, Mass.
Gallagher, William, Pennsylvania Bottle Co., 311 Horton Ave., Sheffield, Pa.
Gallion, F. J., Haynes Stellite Co., Research Dept., Kokomo, Ind.
†Gallup, John, RCA Victor Div., Radio Corp. of America, 415 S. Fifth St., Harrison, N. J.
Gally, J. A., 2390 E. Villa St., Pasadena 8, Calif.
*Galpin, Sidney L., 44 Jones Ave., Morgantown, W. Va.
Galusha, Richard L. (Student), 1711 18th St., N. W., Washington 9, D. C.
Gamble, Lt. (jg) Elton S., San Francisco, Calif.
Ganapule, Anant K., Parshuram Pottery Works Co., Ltd., Morvi, Kathiawar, India
Gangler, James J. (Student), 4044 41st Ave., S. W., Seattle, Wash.
Garbisch, Norbert S., Garco Products, Inc., Box 351, Butler, Pa.
Garco Products, Inc. (Norbert S. Garbisch), Box 351, Butler, Pa.
Garland, C. F., Mason City Brick & Tile Co., Mason City, Iowa
Garland, William, Johnson Glass Co., 5248 Elston Ave., Chicago 30, Ill.
Garson, F. J., New Jersey Porcelain Co., Box 908, Trenton 5, N. J.
*†Garve, T. Walter, 314 King Ave., Columbus 1, Ohio
Garvey, Lawrence P. (Student), Massachusetts Inst. of Tech., Rm. 4-007, 77 Massachusetts Ave., Cambridge 39, Mass.
Gassner, William O., Armstrong Cork Co., Millville, N. J.
Gast, Olga M. (Student), 13820 Othello Ave., Cleveland 10, Ohio
Gates, Major E., 331 McHenry Ave., Crystal Lake, Ill.
†Gates, R. Wayne, 454 Hornel St., Baltimore 24, Md.
Gauger, Alfred W., Pennsylvania State College, State College, Pa.
Gaunt, Charles L., Indiana Glass Co., Dunkirk, Ind.
Gaylord, Ethlyn B., 122 E. Linda Vista Ave., Alhambra, Calif.
Gayner Glass Works (John M. Gayner), Salem, N. J.
Gayner, John M., Gayner Glass Works, Salem, N. J.
Geddes, William J., Denver Sewer Pipe & Clay Co., Box 2329, Denver, Colo.
*†Geiger, Charles F., Carborundum Co., Box 268, Perth Amboy, N. J.
Geiger, Joseph S., 911 Sherman Ave., Apt. 305, Evanston, Ill.
*Geisinger, E. E., Pfaudler Co., 89 East Ave., Rochester 4, N. Y.
*†Geller, R. F., 306 W. Thornapple, Chevy Chase 15, Md.
*Gelstharp, Frederick, 1134 Park St., Tarentum, Pa.
General Ceramics Co. (Fred A. Whitaker), Keasbey, N. J.
General Color & Chemical Co. (Harry J. Keener), Sebring, Ohio
General Electric Co. (W. S. Kahlson), Lamp Dept., Pitney Glass Works, Nela Park, Cleveland, Ohio
General Electric X-Ray Corp. (J. A. Diffendaffer), 2012 W. Jackson Blvd., Chicago 12, Ill.
General Refractories Co. (Russell P. Heuer), 1600 Real Estate Trust Bldg., Philadelphia 7, Pa.
Gentry, Raymond, Alexander H. Kerr & Co., Inc., Box 535, Santa Ana, Calif.
†Gentsch, B. F., Oakfield, N. Y.
George, W. C., W. S. George Pottery Co., East Palestine, Ohio
George, W. S., Pottery Co. (W. C. George), East Palestine, Ohio
Georgia Kaolin Co. (Wharton Jackson), 433 N. Broad St., Elizabeth 3, N. J.
†Gerber, Albert C., 408 W. Walnut St., Robinson, Ill.
Gerber, Max, 232 N. Clark St., Section 1, Chicago 1, Ill.
Gerstenschlager, V., Jr., Babcock & Wilcox Co., Augusta, Ga.
†Gerster, C. W., 19 Forsyth Place, East Liverpool, Ohio
Gesner, M. A., 129 Sherwood Rd., Ridgewood, N. J.
Ghering, Leonard G., Box 847, Butler, Pa.
Ghormley, Glen E., 139 N. Chester Ave., Pasadena 4, Calif.
Gehrke, Edward W. (missing in action), Alfred Univ., Alfred, N. Y.
Gibbs, A. E., 1000 Widener Bldg., Philadelphia, Pa.
Gibbs, Peter W. (Student), 56, The Kingsway, Kingsway Park, Toronto, Ontario, Canada
Gibson, Kenneth A., 230 Washington Ave., Charleroi, Pa.
†Gibson, R. L., 412 E. Winter Ave., New Castle, Pa.
Giehler, Fred J., Chicago Retort & Fire Brick Co., Ottawa, Ill.
Gieseke, Frans, Kockums Emaljerverk, Ronneby, Sweden
Gilbert, Wilfred, Reliance Firebrick & Pottery Co., Barakar, India
Giles, Kenneth B., 1240 Ashland Ave., Zanesville, Ohio
Gilfillan, J. M., Locke Insulator Corp., Box 57, Baltimore 3, Md.
Gill, Edgar C., c/o Mr. Sumner S. Gill, Eaton, N. Y.
Gill, Francis D., Gill Glass & Fixture Co., 1330 Widener Bldg., Philadelphia 7, Pa.
Gill, John H., Gill Clay Pot Co., Muncie, Ind.
†Gill, Joseph W., 563 Hillside Ave., Elmhurst, Ill.
Gill, LaVerne N., American Radiator & Standard Sanitary Corp., Box 1866, Richmond, Calif.
Gillespie, H. M., 225 Broadway, New York 7, N. Y.
Gillinder Brothers, Inc. (J. Fletcher Gillinder), Port Jervis, N. Y.
Gillinder, James, Box 1007, Port Jervis, N. Y.
Gillinder, J. Fletcher, Gillinder Brothers, Inc., Port Jervis, N. Y.
Gimson, Joseph F., Worcester Royal Porcelain Co., Ltd., Royal Porcelain Works, Worcestershire, England
Gingold, Jacob, 104 E. Scribner Ave., Du Bois, Pa.
Girard, R. T., Works Lab., General Electric Co., Schenectady, N. Y.
†Gitter, A. Josephine, Apt. 6A, 2712 Wisconsin Ave., N. W., Washington 7, D. C.
Gitzen, Walter H., 1 Wesley Dr., Belleville, Ill.
Given, Conrad W., Great Lakes Steel Corp., Ecorse, Detroit 18, Mich.
Givens, Lt. Beverly L. (Student), Ft. Benning, Ga.
Gladding, McBean & Co. (F. A. Walsh), Lincoln, Placer County, Calif.
Gladding, Charles, Third and Keyes Sts., San Jose, Calif.
Glaze, Francis W., 4100 Gallatin St., Hyattsville, Md.
Gleason-Tiebout Glass Co. (C. H. Tiebout), 59 54th St., Maspeth, N. Y.
Glenboig Union Fireclay Co., Ltd. (Alexander McKendrick), Laboratory, Star Works, Glenboig, Lanarkshire, Scotland
Glenshaw Glass Co., Inc. (George W. Meyer), Glenshaw, Pa.
Glick, Wendall A., Perfection Stove Co., 7609 Platt Ave., Cleveland 4, Ohio
Globe Brick Co. (S. C. Porter), East Liverpool, Ohio
Goddard, W. T., Box 428, Hamilton, Ontario, Canada
Godejohn, W. F., Laclede-Christy Clay Products Co., 1711 Ambassador Bldg., St. Louis, Mo.
Goetchius, Don R., 4150 East 56th St., Cleveland, Ohio
Goin, Lt. (jg) Fred L., Mobile, Ala.
Goldberg, Leo G., 5629 Kingsley Dr., Indianapolis 5, Ind.
Goldscheider Everlast Corp. (W. F. Goldscheider), 280 Third St., Trenton 10, N. J.
Goldscheider, W. F., Goldscheider Everlast Corp., 280 Third St., Trenton 10, N. J.
Goldsmith, Julian R., 164 Pine St., Corning, N. Y.
Gonder, Lawton, Gonder Ceramic Arts, Inc., Zanesville, Ohio
Goochee, Pvt. Herman, Minneapolis, Minn.
Goodman, Pfc. Gilbert, San Francisco, Calif.
Goodman, H. A., Dominion Fire Brick & Clay Product, Ltd., Claybank, Saskatchewan, Canada
†Goodrich, Hobert R., 469 W. Oak St., Glendale 4, Calif.

Goodwillie, John H., 3041 Hopewell Place, Toledo 6, Ohio
Gordon, Miss Syd Lee, Ceramicenter, Inc., 39 East 35th St., New York 16, N. Y.
Gormly, Alan L., 490 Shrewsbury St., Holden, Mass.
†Gornall, Henry A., 4150 East 56th St., Cleveland, Ohio
Gort, Walter A., 37 Highland Ave., Metuchen, N. J.
*†Gould, Robert E., 28 Union St., Hamburg, N. Y.
*Grady, R. F., Sr., 6825 Mitchell Ave., St. Louis 10, Mo.
Grady, R. F., Jr., Mason City Brick & Tile Co., Mason City, Iowa
Graff, William A. (Student), 306 E. Green, Champaign, Ill.
Grageda, Jose T. (Student), Apartado Postal 363, Guadalajara, Jalisco, Mexico
Grant, Frederic J., 2901 Los Feliz Blvd., Los Angeles 26, Calif.
Grassell, Bert L., 431 E. Sheridan Ave., New Castle, Pa.
Graveling, W. J., Box 559, Laredo, Texas
Gray, William T., 15 West 4th St., Corning, N. Y.
Great Lakes Foundry Sand Co. (C. L. Cruikshank), 720 United Artists Bldg., Detroit 26, Mich.
Great Lakes Steel Corp. (Conrad W. Given), Ecorse, Detroit 18, Mich.
*†Greaves-Walker, A. F., Dept. of Ceramic Engr., Univ. of North Carolina, Raleigh Unit, Raleigh, N. C.
Gredys, Daniel N., Perfection Stove Co., 7609 Platt Ave., Cleveland 4, Ohio
Green, A. P., Fire Brick Co. (R. S. Bradley), Research Dept., Mexico, Mo.
Green, Allen P., A. P. Green Fire Brick Co., Mexico, Mo.
Green, A. T., Mellor Labs., Stoke-on-Trent, England
Green, Robert L., General Electric Co., Research Lab., Schenectady, N. Y.
†Green, Robert S., 18 S. Jefferson Rd., Mexico, Mo.
Greene, Charles H., 230 Chemung St., Corning, N. Y.
Greene, Herbert F., General Refractories Co., Claysburg, Pa.
Greene, J. F., 1123 Pear St., Vineland, N. J.
Greening, Thomas A. (Student), 201 Humberside Ave., Toronto, Ontario, Canada
Greenspan, Le Roy (Student), 3470 Cannon Place, New York 63, N. Y.
Greenstreet, Edward C., 323 Broadmoor Rd., Baltimore 12, Md.
Greeves, Russell G., 1122 Leader Bldg., Cleveland 14, Ohio
Greger, Herbert H., 4410 Macomb St., N. W., Washington 16, D. C.
*†Gregorius, J. S., Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa.
Gregory, G. S., Phoenix Glass Co., Monaca, Pa.
Greider, Harold W., Philip Carey Mfg. Co., Lockland, Cincinnati 15, Ohio
Griffith, James D. (Student), 314 W. Adams St., Clinton, Ill.
Griffith, J. Scott, 1118 East 64th St., Chicago 37, Ill.
Griffith, R. E., 419 Garden Lane, Bryn Mawr, Pa.
Griffiths, Norman, Nonporite Pty., Ltd., 292–296 Burwood Rd., Hawthorn E. 2, Victoria, Australia
Grigorieff, Wladimir W., Lenox, Mass.
Grim, Ralph E., Illinois Geological Survey, Urbana, Ill.
Grimison, E. Douglas, Babcock & Wilcox Co., Refractories Div., Bayonne, N. J.
Grindley Artware Mfg. Co. (A. K. Grindley), Box 166, Sebring, Ohio
Grindley, A. K., Grindley Artware Mfg. Co., Box 166, Sebring, Ohio
Grobb, F. S., Sternson Labs., Ltd., Brantford, Ontario, Canada
Grodsky, James W., 1103 Trenton Place, S. E., Apt. 1-A, Washington 20, D. C.
Groglode, Samuel S., 2700 St. Clair Ave., East Liverpool, Ohio
Grossman, Harold, American Lead Pencil Co., Hoboken, N. J.
Grossman, Israel, Ednal Co., Inc., 95 Madison Ave., New York 16, N. Y.
Grossman, R. B., Southern California Gas Co., Box 3249, Terminal Annex, Los Angeles, Calif.
Guardia, Jorge A. (Student), Box 1075, Panama City, Panama
Guastavino, Rafael, 143 Awixa Ave., Bayshore, Long Island, N. Y.
Guenther, E. B., 16 Duncan Ave., Crafton, Pittsburgh 5, Pa.
Gunzenhauser, Adolf, 617 W. End Ave., New York 24, N. Y.
Gustafson, Dwight F., East 4217 22nd, Spokane 10, Wash.
Gustavsbergs, A. B., Fabriks, Intressenter, Gustavsberg, Stockholm, Sweden
Guthrie, George, "Ochil," Harrow Rd., Sudbury Hill, Wembley, Middlesex, England
Guthrie, George B., 435 W. Martin St., East Palestine Ohio
Gutman, Raymond T., Ohmite Mfg. Co., 4835 Flournoy St., Chicago 44, Ill.
Gutmann, Paul F., 5331 Nottingham Ave., St. Louis 9, Mo.
Gutop, Vadim G., Vsesousnji Institut Stekla, Bolshaja Semenovskaja Ulitza N.10, Moscow, U.S.S.R.
Guy, Thomas J., 703 Hanna Bldg., Cleveland, Ohio

Haaf, George J., 2703 Milton Ave., Solvay 9, N. Y.
Hackler, Lt. W. C. (Student), Saltville, Va.
Haeger Potteries, Inc. (E. H. Haeger), Dundee, Ill.
Haeger, E. H., Haeger Potteries, Inc., Dundee, Ill.
Haff, R. S., Jr., 19 Willard St., Hartford 5, Conn.
Hafner, Harold C., 17 Barnard St., Rochester 12, N. Y.
*†Hagar, Donald, Box 328, Zanesville, Ohio
Hagerman, Capt. Robert S., New York, N. Y.
Hahner, Clarence H., National Bureau of Standards, Washington 25, D. C.
Hale, Edwin, 1139 National Rd., Wheeling, W. Va.
Haley, Kenneth R., 636 Fairmont St., Greensburg, Pa.
Hall China Co. (M. W. Thompson), East Liverpool, Ohio
Hall, Clyde W., United Clay Mines Corp., Trenton 6, N. J.
Hall, E. B., 71 The Park, Ishapore, Bengal, India
Hall, Everson, Park Blvd., East Liverpool, Ohio
*Hall, F. P., Pass & Seymour, Inc., Syracuse 9, N. Y.
Hall, Henry, "Ravenshoe," Kingland Rd., Poole, England
Hall, James L., Metallurgical Dept., American Brake Shoe Co., Mahwah, N. J.
Hall, Lt. (jg) John T., Crane, Ind.
Hall, Morris P., 3218 Shadyway Dr., Pittsburgh 10, Pa.
Haller, P., 106 High Storrs Rd., Sheffield 11, England
Halloin, William G., 1218 Broadview Blvd., Brackenridge, Pa.
Halpern, Allan S. (Student), 54 Huntington Terrace, Newark 8, N. J.
Hamaker, M. L., Columbia Fire Brick Co., First National Bank Bldg., Canton 2, Ohio
Hamer, Donald W. (Student), Byron, Ill.
Hamilton Potteries, Ltd. (H. Redshaw), 100 Locke St., S., Hamilton, Ontario, Canada
Hamilton, D. C., Bartlett-Collins Co., Sapulpa, Okla.
Hampden Grinding Wheel Co. (G. S. Emerson), 118 Fisk Ave., Springfield 7, Mass.
Hancock Brick & Tile Co. (J. Leo Child), Box 59, Findlay, Ohio
Handwerk, Joseph H., 3378 Lennon Rd., Flint 7, Mich.
Hanes, John G., Republic Steel Corp., Warren, Ohio
Haney, H. L., Harshaw Chemical Co., Edwards and Wildey Bldg., 609 S. Grand St., Los Angeles, Calif.
Hanks, Charles F., Jr., 809 S. Mercer Ave., Bloomington, Ill.
Hanley Co. (J. Clair Peck), Summerville, Pa.
†Hanna, H. H., Pittsburgh Plate Glass Co., Crystal City Mo.
Hanna, Henry N., Clinchfield Sand & Feldspar Corp., 618 Mercantile Trust Bldg., Baltimore 2, Md.

Hanovia Chemical & Mfg. Co. (W. Riehl), Chestnut St. and N.J.R.R. Ave., Newark 5, N. J.
†Hansard, W. Carey, 1314 N. Glebe Rd., Arlington, Va.
Hansen, I. A., Fords Porcelain Works, Perth Amboy, N. J.
*Hansen, J. E., Ferro Enamel Corp., 4150 East 56th St., Cleveland 5, Ohio
Hansen, Waldemar C., Universal Atlas Cement Co., Gary, Buffington Sta., Ind.
Hanson, G. G., 4436 N. Maplewood Ave., Chicago 25, Ill.
Hanson, J. R., Diamond Glass Co., Royersford, Pa.
Hanson, Paul M., Jr., 18 Gosnold St., Worcester 6, Mass.
Harbison-Walker Refractories Co. (Kenneth Seaver), 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
Hardenbrook, Roy W., Chem. Lab., Dept. 81B, Taylor Instrument Companies, Box 110, Rochester 1, N. Y.
Harder, Charles M., Alfred Univ., Alfred, N. Y.
Harding, Russell J., Box 496, Ottawa, Ill.
Hardinge Co., Inc. (Harlowe Hardinge), York, Pa.
Hardinge, Harlowe, Hardinge Co., Inc., York, Pa.
†Hardy, R. G., R. D. 5, North Chattanooga, Tenn.
Harker Pottery Co. (Robert E. Boyce), East Liverpool, Ohio
Harley, Ted H. (Student), 2321 Tremont Rd., Columbus, Ohio
*Harman, C. G., 204 Ceramics Bldg., Univ. of Illinois, Urbana, Ill.
Harnish, John D., 401 N. Chestnut St., Derry, Pa.
Harper, Roderick L., Harper Electric Furnace Corp., Niagara Falls, N. Y.
†Harr, William J., 11 Fletcher Ave., Mount Vernon, N. Y.
Harrington, Henry W., 757 Chenango St., Binghamton 6, N. Y.
Harris, Robert W., Dillsboro, N. C.
Harris, S. C., E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Wilmington, Del.
Harris, William J., Crossley Machine Co., Trenton 9, N. J.
Harrison, Harold C., Westinghouse Electric Corp., Engr. Labs. & Stds. 12-L-47, East Pittsburgh, Pa.
*Harrison, W. N., Bureau of Standards, 151 Industrial Bldg., Washington, D. C.
Harshaw Chemical Co. (D. J. Behlen), Intelligence Service Div., 1945 East 97th St., Cleveland 6, Ohio
Hartford-Empire Co. (F. Goodwin Smith), Box 1620, Hartford, Conn.
Harth, P. E., 835 Oleta Dr., Clayton, Mo.
Hartshorn, T. D., A. J. Lindemann & Hoverson Co., Milwaukee 7, Wis.
Hartsook, Jane P. (Student), Box 177, Alfred, N. Y.
Harty, William A., Exolon Co., Tonawanda, N. Y.
Harvey, Capt. A. M., Jr., Roanoke-Webster Brick Co., Box 1001, Roanoke 5, Va.
Harvey, E. M., North State Pyrophyllite Co., Inc., Pomona, N. C.
Harvey, Edwin T., 314 W. McPike St., Vandalia, Mo.
Hasselbach, William, Libbey-Owens-Ford Glass Co., 1701 E. Broadway, Toledo 5, Ohio
Hastings, Francis H., 16 Forest St., Hartford, Conn.
Hatch, J. W., 713 N. Main St., Abingdon, Ill.
Hatch, Robert A., Corning Glass Works, Corning, N. Y.
Hathaway, Isaac, Box 493, Tuskegee Institute, Ala.
Hauser, Ernst A., Massachusetts Inst. of Tech., Cambridge 39, Mass.
Haviland, Theodore, & Co., Inc. (Theodore Haviland, II), 26 West 23rd St., New York 10, N. Y.
Haviland, Theodore, II, Theodore Haviland & Co., Inc., 26 West 23rd St., New York 10, N. Y.
Hawk, Elwin A., Hawk Labs., R. D. 1, East Rochester, Ohio
Hawke, C. E., Carborundum Co., Box 268, Perth Amboy, N. J.
Hawkins, George W., Isolantite, Inc., 343 Cortlandt St., Belleville 9, N. J.
Hawkins, William A., 658 S. Lake Ave., Pasadena 5, Calif.
Hawkinson, John L., 211 Girard Ave., Hartford, Conn.
Hawks, Ralph L. (Student), 3932 North 31st Street, Tacoma 7, Wash.
Haws Refractories Co. (E. E. Slick, Sr.), 2128 Farmers Bank Bldg., Pittsburgh 22, Pa.
Hay, R. G., Central Silica Co., Zanesville, Ohio
Hazel-Atlas Glass Co. (Francis C. Flint), 319 S. Main St., Washington, Pa.
†Hazen, E. J., R. D. 2, Ford City, Pa.
Healy, James H. (Student), 3048 Forest Place, East St. Louis, Ill.
Heaslet, James, Jr., "Blairlea," Stobswood, Morpeth, Northumberland, England
Heath, Chadwick N., 927 Candler Bldg., Atlanta 3, Ga.
*†Heath, Frederick, Jr., 2221 Central Grove Ave., Toledo 9, Ohio
Hebenstreit, W. H., Royal China, Inc., Sebring, Ohio
Heck, F. G., E. J. Lavino & Co., 1528 Walnut St., Philadelphia 2, Pa.
Hedden, Walter A., R. D. 1, East St., Lenox, Mass.
Hedquist, Alfred J., 406 West 4th St., East Liverpool, Ohio
Heiligman, H. A., E. J. Lavino & Co., Box 29, Norristown, Pa.
*Heindl, Raymond A., 4917 43rd St., N. W., Washington 16, D. C.
Heisey, A. H., & Co. (T. C. Heisey), Newark, Ohio
Heisey, T. C., A. H. Heisey & Co., Newark, Ohio
Heistand, Elza F., Gill Clay Pot Co., Muncie, Ind.
Hellman, Eric, 34 W. Tulane Rd., Apt. D, Columbus 2, Ohio
Hellmann, Louis E., 212 Fifth Ave., New York 10, N. Y.
Hellmers, Henry T., R. D. 6, Lancaster, Ohio
*†Helser, Perry D., Gladding, McBean & Co., 2901 Los Feliz Blvd., Los Angeles 26, Calif.
Helton, B. L., Jr., 940 Hickman Rd., Augusta, Ga.
Helz, Armin W., Gaithersburg, Md.
Hemphill, R. W., Colonial Insulator Co., 973 Grant St., Akron 11, Ohio
Hemsteger, Samuel E., 27180 Wellington Rd., Franklin, Mich.
†Henderson, Chester E., 430 11th St., Oakmont, Pa.
*Henderson, H. B., Box 12, East Liverpool, Ohio
Henderson, John H. (Student), 2822 Boylston Ave., N., Seattle 2, Wash.
Henderson, L. A., W. A. Riddell Co., Bucyrus, Ohio
Hendren, Robert R., 618 Weldon St., Latrobe, Pa.
Henricks, John A., 13474 Edgewater Dr., Lakewood 7, Ohio
†Henry, Edward C., Div. of Ceramics, Pennsylvania State College, State College, Pa.
*Henry, Frank R., Simonds Worden White Co., Dayton 7, Ohio
Henry, Georges, Union des Verreries Mecaniques Belges, 41 Quai de Brabant, Charleroi, Belgium
Henry, Kenneth M., Kimble Glass Co., Vineland, N. J.
*†Hepplewhite, J. W., 241 Pennsylvania Ave., East Liverpool, Ohio
Herbert, John S., 174 Third Ave., N., Nashville, Tenn.
Herbert, Paul R., Sparta Ceramic Co., East Sparta, Ohio
Herger, Howard C., Pierce Glass Co., Port Allegany, Pa.
Herman, Adalbert, Distillers Corp., Ltd., 1430 Peel St., Montreal, Quebec, Canada
Hermann, Max, 239 Ocean Ave., Brooklyn, N. Y.
†Herold, John F., Baroid Sales Div., National Lead Co., 830 Ducommun St., Los Angeles 12, Calif.
*†Herold, Paul G., Missouri School of Mines, Rolla, Mo.
Herrick, G. G., Speer Resistor Corp., Box 111, St. Marys, Pa.
Hertzell, E. A., 1104 N. Walnut St., Dover, Ohio
Hess, F. B., Brockway Glass Co., Inc., Brockway, Pa.
Hess, Henry W., 614 Stratford Place, Toledo 10, Ohio
Hess, R. F., North American Refractories Co., Cleveland 14, Ohio
Hess, Ralph F., Jr., 510 Filbert St., Curwensville, Pa.
Hess, R. Jones, 309 S. Centre St., Philipsburg, Pa.
Hess, Robert L. (Student), Dept. of Mineral Tech., Div. of Ceramics, Pennsylvania State College, State College, Pa.
*Hettinger, E. L., 1325 Mineral Spring Rd., Reading, Pa.
Heuer, Russell P., General Refractories Co., 1600 Real Estate Trust Bldg., Philadelphia 7, Pa.
Heussner, Carl E., 552 Brookside Dr., Birmingham, Mich.
Hewitt, Arthur E., Spode Works, Stoke-on-Trent, England

*†Hewitt, L. C., 4705 Ridgewood, St. Louis, Mo.
Heystek, Hendrik, Box 105, Alfred, N. Y.
Hicks, Howard, Thermo Fire Brick Co., Box 277, Sulphur Springs, Texas
Higgins, Ray, 466 Broad St., Wadsworth, Ohio
*Higgins, Waldo W., 5415 N. Shoreland Ave., Milwaukee, Wis.
Higman, John W., Co. (Robert J. Stone), 24 State St., New York 4, N. Y.
Hilgenberg, Carl R., Carr-Lowrey Glass Co., Box 356, Baltimore 3, Md.
*†Hill, E. C., General Grinding Wheel Corp., Clementine, Thompson, and Mercer Sts., Philadelphia 34, Pa.
Hill, Erle G., Wheeling Steel Corp., Wheeling, W. Va.
Hill, Sgt. Q. H., Randolph Field, Texas
Hillier, C. G., Winstone's Roofing Tile Works, Ltd., Taumarunui, North Island, New Zealand
Hinckley, Arthur T., Oldbury Electro-Chemical Co., Niagara Falls, N. Y.
Hind, Stanley, "The Mount," Etruria Rd., Basford, Stoke-on-Trent, England
Hirsh, Erwin J., General Ceramics & Steatite Corp., Plant 3, Research Dept., Keasbey, N. J.
Hirssig, Carl F., 4554 Westway, Toledo 12, Ohio
Hitchins, R. A., National Refractories Co., Inc., 1520 Locust St., Philadelphia 2, Pa.
†Hite, Earl E., R. D. 1, Toronto, Ohio
†Hite, Everett C., 813 23rd St., N. W., Canton, Ohio
Hoare, H. A., Mansfield Sanitary Pottery, Inc., Perrysville, Ohio
Hobert, Leroy F., 318 Huron Ave., Sandusky, Ohio
Hocking, William J., 1612 Pennsylvania Ave., East Liverpool, Ohio
*Hodek, F. E., Jr., 2700 N. Karlov Ave., Chicago 39, Ill.
Hodson, George N., 58 Park Rd., Loughborough, England
Hoehl, Joseph W., Wolverine Porcelain Enameling Co., 3350 Scotten Ave., Detroit 10, Mich.
Hoehn, Charles J. P., 18th and Florida Sts., San Francisco, Calif.
Hoeman, Erwin C., Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio
Hoeppner, W. L., Hayward Optical Glass Co., Box 26, Maywood, Calif.
Hoffman, Ens. Lewis C. (Student), San Francisco, Calif.
Hogan, Thomas W., 276 S. El Molino St., Pasadena 5, Calif.
Hogendobler, H. R., Owens-Corning Fiberglas Corp., Toledo 1, Ohio
Hogenson, William, Chicago Vitreous Enamel Product Co., 1427 South 55th Court, Cicero 50, Ill.
Hohmann, Frederick R., 712 10th St., Oakmont, Pa.
Holberg, A. S., Alabama Clay Products Co., 830–835 Martin Bldg., Birmingham 3, Ala.
Holland, Job, Box 22, Sheffield, England
Holland, J. B., Port Hope Sanitary Mfg. Co., Ltd., Port Hope, Ontario, Canada
Holley, Kenneth E., 72 Bissell Ave., Corning, N. Y.
*†Holmes, Dean M. E., N. Y. State College of Ceramics, Alfred, N. Y.
Holmgren, David E. (Student), 435 E. High St., New Philadelphia, Ohio
Holophane Co., Inc. (Charles Franck), 342 Madison Ave., New York 17, N. Y.
Holscher, H. H., Owens-Illinois Glass Co., General Research Lab., 1700 Westwood Ave., Toledo 1, Ohio
Home Aid Construction Co. (H. K. Brown), 527 Society for Savings Bldg., Cleveland 14, Ohio
Hommel, O., Co. (E. M. Hommel), 209 4th Ave., Pittsburgh 30, Pa.
Hommel, Ernest M., 1520 Valmont St., Pittsburgh, Pa.
*Hood, B. Mifflin, Mifflin Hood Brick Co., Daisy, Tenn.
Hood, Harrison P., 83 East 4th St., Corning, N. Y.
Hoover, Charles H., 3413 Ramona Ave., Baltimore 13, Md.
Hopkins, Robert W., Calumite Co., Hamilton, Ohio
*†Horak, William, Hartford-Empire Co., Hartford 1, Conn.
*†Horning, Roy A., Armstrong Cork Co., Lancaster, Pa.
Hornor, Joseph F., 46 East 3rd St., Corning, N. Y.
†Hornung, Martin R., 140 Sheridan Ave., New Castle, Pa.
Hossenlopp, Arthur M., 28 Kendall Ave., Maplewood, N. J.
*†Hostetter, J. C., Mississippi Glass Co., Main and Angelica Sts., St. Louis 7, Mo.
Hostetter, John R., 8514 Cedar St., Silver Spring, Md.
*Hottinger, A. F. (Life), 927 S. Monroe Ave., Green Bay, Wis.
Hough, Albert W., Box 480, Columbia, S. C.
Houghton, Amory, The Knoll, Corning, N. Y.
Housman, George S., 208 W. Fornance St., Norristown, Pa.
Houze, Armand L., Jr., L. J. Houze Convex Glass Co., Point Marion, Pa.
Houze, L. J., Convex Glass Co., Point Marion, Pa.
*Howat, Walter L., 85 Hopping Ave., Staten Island 7, N. Y.
Howatt, Glenn, 15 Cliffwood Place, Metuchen, N. J.
Hower, Lawrence D., Jr., 6940 Meade St., Pittsburgh 8, Pa.
Howie, John R., Templetonburn, Kilmarnock, Scotland
Howie, Thomas W., United Steel Co., Ltd., Central Research Dept., Stocksbridge, near Sheffield, England
Hoyet, Eugene, Box 213, Natrona Heights, Pa.
Hoyt, Philip S., Van Horn, Texas
Hubbard, C. H., Alexander H. Kerr & Co., Inc., Sand Springs, Okla.
Huber, Harold V., 691 S. Harvard Blvd., Los Angeles 5, Calif.
Hubler, William G., Nepheline Products, Ltd., Lakefield, Ontario, Canada
Hudson, Charles J., Norton Co., Worcester, Mass.
Hug, William O., Lake Desolation, Middle Grove, N. Y.
Hughes, George B., 824 Main St., Cedar Falls, Iowa
†Hughes, Walter M., 534 Putnam Ave., Zanesville, Ohio
Hugill, William, Langham House, Fields Rd., Alsager, England
Hull, A. E., Pottery Co. (Gerald F. Watts), Crooksville, Ohio
*Hull, Walter A., Box 367, Norris, Tenn.
Hults, Eugene A., Box 587, Bristol, Va.
Hummel, D. B., Polaroid Corp., 211 Massachusetts Ave., Cambridge 39, Mass.
Hummel, Floyd A., School of Mineral Ind., Pennsylvania State College, State College, Pa.
Hummel, Richard, 615 Olympia Rd., Pittsburgh 11, Pa.
Hummel, Roy, B. G. Corp., Broad Ave. and Shaler Blvd., Ridgefield, N. J.
Humphrey, Kenneth F. (Student), 419 Lansdowne Ave., Saskatoon, Saskatchewan, Canada
Humphreys, R. D., Mississippi Glass Co., 200 Fifth Ave., New York 10, N. Y.
Hunsicker, Harold W., 1649 Elberon Ave., East Cleveland 12, Ohio
Hunt, George, General Steel Wares, Ltd., 199 River St., Toronto, Ontario, Canada
†Hunt, John F., Orefraction, Inc., 7505 Meade St., Pittsburgh 8, Pa.
Hunt, M. H., Porcelain Products, Inc., Parkersburg, W. Va.
Hunter, Charles E., Box 966, Asheville, N. C.
Hunter, Richard S., National Bureau of Standards, Washington 25, D. C.
Hunting, Everett C., Engr. Dept., Westinghouse Electric Corp., Bloomfield, N. J.
Huppert, Paul A., Lisk Mfg. Co., Ltd., Canandaigua, N. Y.
Hurlbut, Francis J., "High Trees," Eccleston Park, Prescot, Lancashire, England
*†Hursh, Ralph K., Univ. of Illinois, Urbana, Ill.
Hutchins, Otis, Carborundum Co., Niagara Falls, N. Y.
Hutchison, Clark, 851 N. Clay St., Frankfort, Ind.
Hutchison, Clyde B., Box 225, Sandersville, Ga.
†Hutchison, R. C., R. D. 1, Easton Ave., Bethlehem, Pa.
Hutt, Gordon M., Development Commissioner, Rm. 703, Windsor Sta., Canadian Pacific Railway, Montreal, Quebec, Canada
Hyland, J. A., Pacific Coast Borax Co., 2295 Lumber St., Chicago 16, Ill.
Hyslop, Joseph F., "Dromore," Major's Loan, Falkirk, Scotland

Ideal Tooth, Inc. (Martin Myerson), 90 Hamilton St., Cambridge 39, Mass.
Iles, Ramon R., 1102 Lenox Ave., Utica, N. Y.
Iliff, John W., 15401 Richmond Place, East Cleveland, Ohio
Illing, Arno M., 203 Hartwell Ave., Cincinnati 15, Ohio
Illinois Clay Products Co. (Otis L. Jones), 214 Barber Bldg., Joliet, Ill.
Illinois Water Treatment Co. (W. S. Morrison), Rockford, Ill.
Imperial Glass Corp. (C. J. Uhrmann), Bellaire, Ohio
Indiana Glass Co. (Charles L. Gaunt), Dunkirk, Ind.
Industrial Ceramic Products, Inc. (W. E. Cramer), 965 W. Fifth Ave., Columbus 8, Ohio
Industrial Filter Sack Co. (Hugh Nile), Wellsville, Ohio
Ingersoll, Harry, 2600 West 154th St., Gardena, Calif.
Ingham, David M., 58 E. Main St., Ripley, N. Y.
Ingle, Henry W., 35 Giddings Ave., Windsor, Conn.
Ingram-Richardson Mfg. Co. of Indiana, Inc. (C. P. Scripture), Frankfort, Ind.
Inland Fire Brick Company (George S. Davies), 3120 Berea Rd. at Elmwood Ave., Cleveland 11, Ohio
†Innes, David H., Box F, Berlin, N. J.
*Insley, Herbert, Dept. of Earth Sciences, School of Mineral Ind., Pennsylvania State College, State College, Pa.
International Clay Machinery Co. (R. H. McElroy), 1145 Bolander Ave., Dayton, Ohio
International Smelting & Refining Co. (W. M. Weathers), 577 Malvern Rd., Akron 3, Ohio
Ironton Fire Brick Co. (E. F. Myers), 707 Carolina Life Bldg., Box 1324, Columbia 56, S. C.
†Irvine, George C., 2251 Orchard Ave., Niagara Falls, Ontario, Canada
Irwin, Dewitt D., Potters Supply Co., East Liverpool, Ohio
Irwin, J. P., Arthur G. McKee & Co., 2300 Chester Ave., Cleveland 1, Ohio
Irwin, Philip P., Box 320, Manor Lane, East Liverpool, Ohio
Irwin, William W., Potters Supply Co., East Liverpool, Ohio
Isenhour, C. W., Jr., Isenhour Brick & Tile Co., Box 213, Salisbury, N. C.
*Isenhour, John H., Isenhour Brick & Tile Co., Box 213, Salisbury, N. C.
Isolantite, Inc. (George W. Hawkins), 343 Cortlandt St., Belleville 9, N. J.
Israel, Mary E., 6203-A Malabar, Huntington Park, Calif.

†Jackson, A. Curtis, 464 Eastmoor Blvd., Columbus 9, Ohio
Jackson, James, Ashgrove, Bothwell, Lanarkshire, Scotland
Jackson, L. P., Mid-West Abrasive Co., Owosso, Mich.
Jackson, Wharton, Georgia Kaolin Co., Dry Branch, Ga.
Jacobi, James H. (Student), Molino, Fla.
Jacobs, Charles W. F., Box 95, Alfred, N. Y.
Jacobs, Louis J., Ramtite Co., 2563 West 18th St., Chicago 8, Ill.
Jacobs, Richard A., 731 Benoni Ave., Fairmont, W. Va.
Jacobson, Albert, 29 West 8th St., New York 11, N. Y.
Jacoby, Clarence A., Radio Corp. of America, RCA Victor Div., 415 S. Fifth St., Harrison, N. J.
Jahns, Alfred H., 6033 Wellesley Way, Seattle 5, Wash.
Jansma, Frank, Box 519, Washington, Pa.
Jarman, G. W., 110 East 42nd St., New York 17, N. Y.
Jarrett, LeGrand, Westinghouse Electric Corp., Glass Plant, Fairmont, W. Va.
Jeffery, Benjamin A., Ceramic Div., Champion Spark Plug Co., 8525 Butler Ave., Detroit 11, Mich.
Jeffrey, G. H., R.D. 1, Pines Lake, Paterson, N. J.
Jenkins, Howard F., 235 North 2nd St., Jeannette, Pa.
Jenks, C. E., W. S. Tyler Co., 3615 Superior Ave., N. E., Cleveland 14, Ohio
*Jeppson, George N., Norton Co., Worcester 6, Mass.
Jewart, Charles N., 88 Grafton Ave., Blasdell Branch, Buffalo 19, N. Y.

Jobling-Purser, Ernest J., James A. Jobling & Co., Ltd., Wear Glass Works, Sunderland, England
Johns-Manville Sales Corp. (J. C. Crawford, Jr.), 22 East 40th St., New York 16, N. Y.
Johnson Glass Co. (William Garland), 5248 Elston Ave., Chicago 30, Ill.
Johnson, A. B., 112 Inman Circle, Atlanta, Ga.
Johnson, Alexander H., H. L. Brisbane & Wunderlich, Ltd., Lord St., East Perth, West Australia
Johnson, Andrew L., Massachusetts Inst. of Tech., Cambridge 39, Mass.
Johnson, Ernest W., 971 Mountain Ave., Westfield, N. J.
Johnson, F. G., Messrs. Johnson Brothers, Hanley, Staffordshire, England
Johnson, Gordon H. (Student), 106 E. Chalmers, Champaign, Ill.
Johnson, Harold C., 158 Davis St., Bradford, Pa.
Johnson, Hugo E., 714 Frick Bldg., Pittsburgh 30, Pa.
Johnson, J. A., Service Engineers, Ltd., Leek New Rd., Cobridge, Burslem, Stoke-on-Trent, England
Johnson, Paul V., National Bureau of Standards, Washington 25, D. C.
Johnson, Peter D. (Student), R. D. 2, Concord, Mass.
Johnston, Archie, Jr. (Student), 945 Gordon St., S. W., Atlanta, Ga.
Johnston, H. J. C., Leeds Fire Clay Co., Wortley, Leeds, England
Jones Metal Products Co., West Lafayette, Ohio
†Jones, Edmund, Jr., Atlas Lumnite Cement Co., 1617 Pennsylvania Blvd., Broad Street Sta. Bldg., Philadelphia 3, Pa.
Jones, Frank L., Bausch & Lomb Optical Co., Rochester, N. Y.
Jones, Harry N., Owens-Corning Fiberglas Corp., Ashton, R. I.
Jones, Maynard J., 267 Colwick Rd., Rochester 11, N. Y.
Jones, Otis L., Illinois Clay Products Co., 214 Barber Bldg., Joliet, Ill.
Jones, Richard E., Pittsburgh Plate Glass Co., Research Lab., Creighton, Pa.
Jones, Thorold G., E. 4, Treforest Trading Estate, near Pontypridd, Glamorganshire, South Wales
Jordan, John W., Mellon Inst., Pittsburgh 13, Pa.
Jordan, Roy E., Jr., Atlantic Tile Mfg. Co., Matawan, N. J.
Jordan, Russell K., Westinghouse Electric Corp., Derry, Pa.
Jova Brick Works (J. L. Jova), Roseton, N. Y.
Jova, J. L., Jova Brick Works, Roseton, N. Y.

Kaeppel, Herbert V., Industrial Publications, Inc., 59 E. Van Buren St., Chicago 5, Ill.
Kahlson, W. S., General Electric Co., Lamp Dept., Pitney Glass Works, Nela Park, Cleveland, Ohio
Kaley, Mary E., Box 257, Watsonville, Calif.
Kallstedt, C. H., Western United Gas & Electric Co., 50 Fox St., Aurora, Ill.
Kalousek, George L., 630 Virginia, Toledo 10, Ohio
Kantner, Ogden A., 562 Cleardale Ave., Trenton 8, N. J.
Kantor, Neil I. (Student), 225 Parkside Ave., Brooklyn 26, N. Y.
Kapner, Charles, Bellaire Enamel Co., Bellaire, Ohio
Kasten, Vernon L. (Student), Three Oaks, Box 84, Jackson, Mo.
*†Kauffman, John R., Allied Engineering Co., 29 Highland Dr., Milltown, N. J.
*†Kautz, Karl, 754 Rotch Ave., N. E., Massillon, Ohio
Kayser, Julius A., 1711 Ambassador Bldg., St. Louis 1, Mo.
Keaney, J. C., 855 Academy Place, Pittsburgh 16, Pa.
Kearins, E. F., National Mortar & Supply Co., 1520 Grant Bldg., Pittsburgh, Pa.
Kebler, Leonard, Ward Leonard Electric Co., Mount Vernon, N. Y.
Keener, Harry J., General Color & Chemical Co., Sebring, Ohio
Keith, Wendell P., Norton Co., Worcester 6, Mass.

Keller, W. D., 203 Swallow Hall, Univ. of Missouri, Columbia, Mo.
Kelly, Joseph F., 301 Braddock Ave., Lansdowne, Pa.
*Kelsey, V. V., Dominion Minerals, Inc., Shoreham Bldg., Washington 5, D. C.
†Kempf, William C., 28 Homer Place, Metuchen, N. J.
†Kenagy, William L., Huntingdon Valley, Pa.
Kendrick, Thomas B. E., United States Glass Co., Glassport, Pa.
Kennaday, Clinton R., R. D. 4, New Castle, Pa.
†Kent, G. G., Square D Co., Peru, Ind.
†Kent, N. Johnson, Johns-Manville Sales Corp., 22 East 40th St., New York 16, N. Y.
Kentucky Clay Mining Co. (W. J. Watkins), Mayfield, Ky.
Kentucky-Tennessee Clay Co. (R. C. Meeker), 807 City Savings Bldg., Alliance, Ohio
*†Keplinger, Robert B., 219 Seventeenth St., N. E., Canton, Ohio
Kerr, Alexander H., & Co., Inc. (C. H. Hubbard), Sand Springs, Okla.
*Kerr, Charles H., 1020 LeRoy St., San Diego, Calif.
*†Kerr, W. R., Armstrong Cork Co., 27th St. Plant, Beaver Falls, Pa.
Kiburz, Walter H., Jr. (Student), 4936 Holly Hills, St. Louis, Mo.
†Kidner, Vernon H., 325 Cedar Blvd., Pittsburgh 16, Pa.
Kidwell, J. F., 4026 Beechwood Blvd., Pittsburgh 17, Pa.
Kiehl, Harry R., 223 Chemung St., Corning, N. Y.
Kimble Glass Co. (M. A. Eddy), Vineland, N. J.
Kimble, Herman K., Kimble Glass Co., Vineland, N. J.
Kimes, Arthur W., *National Glass Budget*, Rm. 405–6, 313 Sixth Ave., Pittsburgh 22, Pa.
*†King, Burnham W., Jr., Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio
King, Charles B., 127 E. First St., Corning, N. Y.
King, James S., Box 56, Negley, Ohio
King, Maxon H., Hill Blvd., East Liverpool, Ohio
*†King, R. M., Lord Hall, Ohio State Univ., Columbus 10, Ohio
King, Walter F., 618 Norway Ave., Trenton 9, N. J.
Kingsbury, Howard F., 509 Vallamont Dr., Williamsport 16, Pa.
Kingsley, Charles B., Mississippi Glass Co., Floreffe, Pa.
*Kinzie, C. J., Box 821, Falls Sta., Niagara Falls, N. Y.
Kirchner, Alfred M., 758 Frick Annex Bldg., Pittsburgh 19, Pa.
Kirk, H. C., 117 Greenlee Rd., Pittsburgh 10, Pa.
Kirkendale, George A., Dept. of Mines, Industrial Minerals Div., Lydia St., Ottawa, Ontario, Canada
*Kirkpatrick, F. A., 466 Columbia Ave., Pomona, Calif.
Kitaigorodsky, J. J., Petrovsky Blvd., 4–6 App. 4, Moscow, U.S.S.R.
Kleiman, Martin M. W., 270 Selkirk Ave., Winnipeg, Manitoba, Canada
*Klein, A. Albert, Norton Co., Worcester 6, Mass.
Kleinfeldt, H. F., Abbé Engineering Co., 50 Church St., New York 7, N. Y.
Klekotka, Joseph, 3601 Reed St., Philadelphia 46, Pa.
*Kleymeyer, Henry C., Standard Brick & Tile Corp., Evansville 19, Ind.
Kline, Hugh L., Corhart Refractories Co., Inc., 16th and Lee Sts., Louisville 10, Ky.
*†Klinefelter, T. A., Southern Expt. Sta., U. S. Bureau of Mines, Tuscaloosa, Ala.
Kling, Jackson D., Zenith Optical Co., 832 Fifth Ave., Huntington 19, W. Va.
Klocke, Edward J., H. C. Spinks Clay Co., Box 256, Newport, Ky.
Knapp, Thomas E., 430 E. Winter Ave., New Castle, Pa.
†Knapp, William J., 15 Blake St., Belmont, Mass.
Knauft, Robert W., Charles Taylor Sons Co., Cincinnati 14, Ohio
†Knecht, Albert O., 2210 E. Main St., Springfield, Ohio
Knight, E. H., Maurice A. Knight Sons' Co., Box 150, Crooksville, Ohio
*Knight, Frank P., Jr., Christmas, via Winkelman, Ariz.
Knight, Maurice A., "Knight-Ware" (M. A. Knight, Jr.), Box 111, Akron 9, Ohio
Knight, M. A., Jr., Maurice A. Knight, "Knight-Ware," Box 111, Akron 9, Ohio
Knight, Mellen A., Preston Labs., Box 847, Butler, Pa.
Knighton, Heywood J. (Student), 805 Trombley Rd., Grosse Pointe Park 30, Mich.
Knizek, J. O., Compania Mexicana de Tubos de Albañal, S. A., Ferroerriles Nacionales 200, Mexico, D. F., Mexico
Knoblaugh, Walter C., 225 E. Market St., Tiffin, Ohio
Knoesel, W. F., Mitchell Clay Mfg. Co., 5627 Manchester Ave., St. Louis 10, Mo.
Knowles, Edwin M., China Co. (J. W. Hepplewhite), Newell, W. Va.
*Knowles, W. V., 8417 W. Rivershore Dr., Niagara Falls, N. Y.
Knox Glass Associates, Inc. (R. R. Underwood), Knox, Pa.
Knox Glass Bottle Co. (J. H. Levis), Knox, Pa.
Kobler, Carl, Porcelier Mfg. Co., South Greensburg, Pa.
Kocatopcu, Sahap S. (Student), Inst. of Research and Investigation of Mining, Ankara, Turkey
Koch, Frank, National Sales Corp., 31 E. Thirteenth St., Cincinnati 10, Ohio
Koch, M. R., Omaha Univ., 60th and Dodge Sts., Omaha, Neb.
Koch, William J. (Student), 407 Lincoln Ave., Highland Park, N. J.
Kocher, Daniel W., 2693 Hibbert Ave., Columbus, Ohio
†Koehler, W. A., Mineral Industries Bldg., West Virginia Univ., Morgantown, W. Va.
*†Koenig, Lt. C. J., 1900 Florida Ave., N. W., Washington, D. C.
Koenig, E. W., Erwin, Tenn.
Koenig, F. J. M., 602 W. Main St., Dundee, Ill.
*†Koenig, John H., Rutgers Univ., Ceramic Dept., New Brunswick, N. J.
Kohler Co. (Carl J. Kohler), Kohler, Wis.
Kohler, Anthony M., Babcock & Wilcox Co., 85 Liberty St., New York 6, N. Y.
Kohler, Carl J., Kohler Co., Kohler, Wis.
Kohn, George F., Precision Grinding Wheel Co., Inc., 8301 Torresdale Ave., Philadelphia 36, Pa.
Kohn, Joseph, Universal Dental Co., 48th and Brown Sts., Philadelphia 39, Pa.
Kohne, Frank H., 1700 3rd Ave., New Brighton, Pa.
Kolene Corp. (J. H. Shoemaker), 315 Boulevard Bldg., Detroit 2, Mich.
†Koos, E. K., Sterling China Co., East Liverpool, Ohio
Kopp Glass, Inc. (C. E. Leberknight), Box 8255, Pittsburgh 18, Pa.
Koppers Co., Inc. (Carl D. Ulmer), Research Div., 945 Koppers Bldg., Pittsburgh 19, Pa.
Koupal, Walter G., Pittsburgh Plate Glass Co., Clarksburg, W. Va.
Kovacs, John, R.D. 29, Mountainside, N. J.
Kraft, C. W., Kraftile Co., Niles, Calif.
Kraftile Co. (C. W. Kraft), Niles, Calif.
Krampf, Francis G., Forest View, R.D. 1, Painted Post, N. Y.
*†Kraner, Hobart M., Research Dept., Bethlehem Steel Co., Bethlehem, Pa.
Kraus, Charles E., Kraus Research Labs., Sparks, Md.
Krause, George, 2321 N. Maple Ave., Zanesville, Ohio
Kreger, John M., 123 Prospect St., Woodbridge, N. J.
Krehbiel, Frederick H., 88 Lincoln St., Pataskala, Ohio
Krehbiel, H. O., Accurate Pyrometric Cone Co., Pataskala, Ohio
Kreidl, M/Sgt. E. L., Ft. Belvoir, Va.
Kreidl, Ignaz, 155 Waverly Place, New York 14, N. Y.
Kreidl, Norbert J., 475 Gardham Rd., Rochester 12, N. Y.
Kreidl, Werner, 155 Waverly Place, New York 14, N. Y.
Kretschmar, Ernest, 8051 Crescent Dr., Clayton, Mo.
†Kriegel, Major William W., New York 4, N. Y.
Krill, Karl E. (Student), 4455 A, Russell Ave., St. Louis 10, Mo.
Kruesi, Paul J., American Lava Corp., Chattanooga 5, Tenn.
Kruson, Joseph H., Big Savage Refractories Corp., Frostburg, Md.
†Kuechler, Adolph, 27 Banks St., Waltham 54, Mass.

Kuhlman, Ernest A., 12902 Farringdon Ave., Cleveland, Ohio
Kumar, Raj, Khemchand Rajkumar, Jullundur City, Punjab, India
†Kunzman, Edward E., Box 12, Oakmont, Pa.
Kurz, Walther, 291 Market St., Newark 5, N. J.
Kutchka, Karl G., 609 Whitney Ave., Wilkinsburg, Pittsburgh 21, Pa.
Kwate, Bernard, S 1/c, Del Monte, Calif.
Kyle, H. Clinton, 34 Radium St., Pittsburgh 14, Pa.

Laboratorio Químico Nacional (Jorge Ancizar-Sordo), Ministerio de Minas y Petróleos, Apartado 2577, Bogotá, Colombia
Laclede-Christy Clay Products Co. (W. F. Godejohn), 1711 Ambassador Bldg., St. Louis, Mo.
Lacy, Roy, Pacific Clay Products, Box 145, Sta. A, Los Angeles 31, Calif.
Laird, Clinton N., c/o Mrs. L. A. Klingler, 757 Pierpont St., Rahway, N. J.
Laird, Stanley M., Box 1948, Las Vegas, Nev.
†Lambe, C. M., 1034 Murray Hill Ave., Pittsburgh 17, Pa.
Lambelet, Clarence A. (Student), Cuba, Mo.
Lambert, Charles F., Clayton & Lambert Mfg. Co., 11111 French Rd., Detroit 5, Mich.
Lambertson, Wingate A., Rich Square, N. C.
Lambie, J. M., Findlay Clay Products Co., Washington, Pa.
†Lampman, Charles M., Jr., Narragansett Ave., R.D. 1, Pittsfield, Mass.
Lancaster Iron Works, Inc. (Frank A. Fix), Lancaster, Pa.
Lancaster Lens Co. (H. G. Crumbaker), 220–226 W. Main St., Lancaster, Ohio
Landron, Rafael, Jr., Box 272, Corning, N. Y.
*Landrum, R. D., Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio
Lane, George J., 88 Linden Ave., Metuchen, N. J.
†Lane, Richard O., Macklin Co., Jackson, Mich.
Lang, George F., Carr-Lowrey Glass Co., Box 356, Baltimore 3, Md.
Lang, Sgt. Stewart M. (Student), New York, N. Y.
Lange, Louis A., 2603 St. Clair Ave., East Liverpool, Ohio
Langrod, Kasimir, 44 Kensington St., New Haven, Conn.
Langseth, Emma (Student), Box 291, Alfred, N. Y.
Lankford, H. Y., 648 Roosevelt St., Gary, Ind.
Lannes, Eugene M., 243 Rock St., Fostoria, Ohio
Lapp Insulator Co., Inc. (K. E. Stettinius), Le Roy, N. Y.
*Lapp, G. W., Lapp Insulator Co., Inc., Le Roy, N. Y.
Larkin, Paul G., Box 371, Campbell, Calif.
Lasiter, Gordon W., Co-Operative Enameling Co., 2335 East 67th St., Cleveland, Ohio
Lassman, Benjamin, Hydraulics, Inc., Oliver Bldg., Pittsburgh, Pa.
Laster, Sidney E. (Student), 142 Hamilton St., New Brunswick, N. J.
Latchford-Marble Glass Co. (Baird Marble), Box 4707, Florence Branch, Los Angeles 1, Calif.
†Latimer, Horace L., 1709 Copeman Blvd., Flint 4, Mich.
Lauck, Donald G., E. J. Lavino & Co., 1819 Oliver Bldg., Pittsburgh 22, Pa.
Laughlin, Homer, China Co. (Joseph Wells), Newell, W. Va.
Laurens Glass Works, Inc. (E. D. Easterby), Laurens, S. C.
Laurie, Dominick (Student), Box 2, Alfred, N. Y.
Lava Crucible Co. of Pittsburgh (Furman South, Jr.), 627 Wabash Bldg., Pittsburgh 22, Pa.
Lawrence, Frederick B., Drawer "G," Newell, W. Va.
Lawrence, Ralph V. (Student), R.D. 1, Box 20, Christiansburg, Va.
Lawrence, Willis G., American Brake Shoe Co., Metallurgical Dept., Mahwah, N. J.
Lawson, Robert W., Box 275, Erwin, Tenn.
Lawton, A. V., 367 Harden St., Antioch, Ill.
Lea, Arthur C., Residence National Smelting Co., Ltd., Avonmouth, Bristol, England
Leavy, John C., 64 Netherwood Ave., Plainfield, N. J.

Leberknight, C. E., Kopp Glass, Inc., Box 8255, Pittsburgh 18, Pa.
LeCompte, Stuart B., Jr., 128 Bloomfield Ave., Windsor, Conn.
Lee Clay Products Co. (Martin S. Bowne), Clearfield, Ky.
Lee, Harley C., Basic Refractories, Inc., 845 Hanna Bldg., Cleveland, Ohio
†Lee, P. William, 205 Elmwood Blvd., York, Pa.
Leech, John L., Findlay Clay Products Co., Washington, Pa.
Lees, Arch A., 411 Avon Dr., Pittsburgh 16, Pa.
Le Heron, Harold, Etablissements Porcher, Usines de Revin, Ardennes, France
†Leibson, J. S., Porcelain Mfg. Div., General Electric Co., Schenectady 5, N. Y.
Leighton, M. M., 100 Natural Resources Bldg., State Geological Survey, Urbana, Ill.
Leitten, Carl F., 50 Hawkins Ave., Hamburg, N. Y.
Lemmerman, Paul C., E. I. du Pont de Nemours & Co., Inc., Grasselli Chemicals Dept., Guardian Bldg., Cleveland 14, Ohio
LeMunyon, James S., 250 Wayne St., Mansfield, Ohio
*Lenchner, Theodore, 5720 Munhall Rd., Pittsburgh 17, Pa.
Lennon, John W., Mellon Inst., 4400 Fifth Ave., Pittsburgh 13, Pa.
Lenz, Vernon W., 6128 S. Richmond St., Chicago 29, Ill.
Lesar, Albert R., 408 Yale St., Mexico, Mo.
Lester, Frank P., 953 Goss Rd., Cincinnati 29, Ohio
*Lester, W. Ronald, 4112 Ethland Ave., Baltimore 7, Md.
Letort, Marc Yves, 16 Rue Lalo, Paris 16, France
Levi, Ormonde S., Save Electric Corp., 615 Front St., Toledo 5, Ohio
Levis, J. H., Knox Glass Bottle Co., Knox, Pa.
Lewis, Evan J., 218 Watauga Ave., Corning, N. Y.
Lewis, J. H., Blue Ridge Glass Corp., Kingsport, Tenn.
Libbey Glass, Div. of Owens-Illinois Glass Co. (H. R. Black), Toledo 1, Ohio
Libbey-Owens-Ford Glass Co. (George B. Watkins), 1701 E. Broadway, Toledo, Ohio
Liberty Glass Co. (George F. Collins, Jr.), 317 E. Lee, Sapulpa, Okla.
*Lillie, Howard R., 191 Delevan Ave., Corning, N. Y.
Lilly, Adam, 8010 Hohman Ave., Munster, Ind.
†Limes, Capt. Robert W., 1901 Aberdeen Ave., Columbus 3, Ohio
Lin, Cho-Yuan, Ferro Enamel Corp., 4150 East 56th St., Cleveland 5, Ohio
Linder, Cyril S., 1139 Park St., Tarentum, Pa.
Lindsay, George W., 2301 Blake St., Box 5510, Terminal Sta., Denver 17, Colo.
Ling, Meng-chang, 709 North 7th St., Allentown, Pa.
*†Lintz, E. H., 3008 Mayfield Ave., La Crescenta, Calif.
Linz, Arthur, Climax Molybdenum Co., 500 Fifth Ave., New York 18, N. Y.
Lisk Manufacturing Co., Ltd. (Ashley F. Wilson, Jr.), Canandaigua, N. Y.
*Littleton, J. T., Corning Glass Works, Corning, N. Y.
Litvakovsky, Adolf A., Vsesousnji Institut Stekla, Bolshaja Semenovskaja Ulitza N 10, Moscow, U.S.S.R.
Liu, Konleon, 21 Harrison Ave., Boston, Mass.
†Lobaugh, Frank E., 1052 Sherman Ave., Plainfield, N. J.
Locke Insulator Corp. (J. M. Gilfillan), Box 57, Baltimore 3, Md.
Lohman, Charles P., Pemco Corp., Eastern Ave., Baltimore 24, Md.
Long, Bernard, 8, rue de Copenhague (8e), Paris 8, France
Long, George R., Frigidaire Div., General Motors Corp., Dayton 9, Ohio
Long, Luther L., Owens-Corning Fiberglas Corp., Newark, Ohio
Long, Robert, American Porcelain Enamel Co., 1205 Keating Ave., Muskegon 36, Mich.
Long, Robert R., 130 W. Culbertson St., Fostoria, Ohio
Long, Russell E., Box 263, Ligonier, Pa.

*†Loomis, George A., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Loring, Albert D., 1278 Michigan Ave., Cincinnati, Ohio
†Louden, R. H., McGean Chemical Co., 1106 Republic Bldg., Cleveland 15, Ohio
Loughridge, Frederick A. (Student), 183 West 6th St., Corning, N. Y.
Louisville Fire Brick Works (Louis Ernst), 4554 Louisville Ave., Louisville 9, Ky.
Louthan Manufacturing Co. (William B. Louthan), East Liverpool, Ohio
Louthan, William B., Louthan Mfg. Co., East Liverpool, Ohio
Love, L. G., National Lime and Stone Co., First National Bldg., Findlay, Ohio
Love, Merle B., R. D. 2, Box 136, Greensburg, Pa.
*Lovejoy, Ellis (Charter Life), 480 West 6th Ave., Columbus 1, Ohio
Lowe, George K., Charles Taylor Sons Co., Heights-Rockefeller Bldg., Rm. 210, Mayfield at Lee, Cleveland 18, Ohio
Loy, John G., Porcelain Products, Inc., Box 300, Findlay, Ohio
Lucas, Clay N., 2716 Reynier St., Los Angeles 34, Calif.
Lucas, Joseph M., 1758 10th St., Cuyahoga Falls, Ohio
Lucke, Charles E., Columbia Univ., Pupin Bldg., New York 27, N. Y.
Lueders, Roland, 3241 Bradford Rd., Cleveland Heights 18, Ohio
Lukas, J. C., Ransome Machinery Co., Dunellen, N. J.
Lukens, Alan R., 11 Windsor St., Cambridge, Mass.
†Luks, Daniel W., Barbertown Rd., Frenchtown, N. J.
Lull, Stanley E., Sylvania Electric Products, Inc., 126 Washington St., Salem, Mass.
Lund, Melvin S., 2363 S. Freedom Ave., Alliance, Ohio
Lund, Richard J., 70 Mason Dr., Manhasset, N. Y.
*Lundell, Gustav E. F., National Bureau of Standards, Washington 25, D. C.
Lunn, C. A., Consolidated Edison Co. of New York, Inc., 4 Irving Place, New York 3, N. Y.
Luster, Vaylord R., 490 Canton, Detroit 7, Mich.
Lutton, X. W., 347 Haddon Ave., Collingswood, N. J.
*Lyle, Aaron K., 21 Cumberland Rd., West Hartford 7, Conn.
Lyman, Stuart (Student), 64 Bedford, S. E., Minneapolis 14, Minn.
Lynch, A. J., & Co. (W. W. Cadwallader), 2424 Enterprise St., Los Angeles 21, Calif.
Lynch, Eugene D. (Student), Kentuckiana Potteries, Inc., Paducah, Ky.
Lynn, H. K., Summitville Face Brick Co., Summitville, Ohio
*Lyon, Kenneth C., Armstrong Cork Co., Millville, N. J.
Lyon, Louis, Jr., National Refractories Co., Inc., Oliver Bldg., Pittsburgh, Pa.
Lyons, Robert L., Waltham Grinding Wheel Co., Waltham, Mass.
Lyons, S. C., 133 Lowell St., Arlington Heights 74, Mass.
Lytle, W. O., Pittsburgh Plate Glass Co., Research Lab., Creighton, Pa.

MacAlpine, William M., 357 E. Main St., Somerville, N. J.
MacDonald, James E., 713 Highland Ave., Latrobe, Pa.
†MacDonald, R. W., 22 Holly Rd., Oakmont, Wheeling, W. Va.
Mackasek, Edward, 1010 Vermont Ave., N. W., Washington 5, D. C.
MacKenzie, James T., 4300 Glenwood Ave., Birmingham 5, Ala.
Maddock, A. M., Titusville, N. J.
†Maddock, J. B., Paper Makers Importing Co., Inc., Drake Bldg., Easton, Pa.
Maddux, William H., 3020 Fletcher Dr., Los Angeles 41, Calif.
Magid, H. S., American Radiator & Standard Sanitary Corp., Box 907, Trenton 5, N. J.
Magnuson, J. W., 345 S. Race St., Denver, Colo.
Mahaffy, Wendel A., Owens-Illinois Glass Co., 601 36th Ave., Oakland 1, Calif.
Mahoney, James A., Co., Inc. (James A. Mahoney), 89 James St., Newark, N. J.
Mahoney, James A., James A. Mahoney Co., Inc., 89 James St., Newark, N. J.
Majeske, Joseph, T. C. Wheaton Co., Millville, N. J.
Malkin, W. R., B. F. Drakenfeld & Co., Inc., East Liverpool, Ohio
Mallick, Edward L., 203 West 2nd Ave., Derry, Pa.
Mallinger, Benjamin, Samuel Mallinger Co., 1855 Forbes St., Pittsburgh 19, Pa.
Mallinger, Samuel, Co. (Benjamin Mallinger), 1855 Forbes St., Pittsburgh 19, Pa.
Mallonn, P. A., Republic Stamping & Enameling Co., Box 471, Canton 1, Ohio
†Malm, Arthur T., 233 Beverly Rd., Worcester, Mass.
Malsch, Werner, 402 6th Ave., Belmar, N. J.
Manker, William, Padua Hills, Claremont, Calif.
Mankin, Paul A., Associated Engineers, Inc., 230 E. Berry St., Fort Wayne 2, Ind.
Manning, John A., 34 Belmont St., Worcester 5, Mass.
Mansfield Sanitary Pottery, Inc. (H. A. Hoare), Perrysville, Ohio
*Manson, M. E., Box 1480, Palm Springs, Calif.
Mansur, Howard, 151 S. Washington St., Spokane 8, Wash.
Marbaker, Edward E., Mellon Inst., Oakland Sta., Pittsburgh 13, Pa.
Marble, Baird, Latchford-Marble Glass Co., Box 4707, Florence Branch, Los Angeles 1, Calif.
Marboe, Evelyn C., Glass Science, Inc., State College, Pa.
Marienville Glass Co. (Clarence R. Deible), Marienville, Pa.
Markert, Fred S., 21341 Aberdeen Rd., Rocky River 16, Ohio
†Marley, Henry E., Box 145, Alfred, N. Y.
Marlow, James A. (Student), 405 Fifth Ave., N., Saskatoon, Saskatchewan, Canada
Marquis, John, Pemco Corp., 5601 Eastern Ave., Baltimore 24, Md.
Marsh, Frank L., National Gypsum Co., Clarence Center, N. Y.
Marshall-Eclipse Div., Bendix Aviation Corp. (F. Weyburne), Box 538, Troy, N. Y.
Marshall, Paul A., 1201 Cherry St., Brockway, Pa.
Marshall, S. C., Certain-teed Products Corp., 120 S. La Salle St., Chicago 3, Ill.
Martin, Frank B., R.D., Sunset Blvd., Cape May, N. J.
Martin, George D. (Student), 581 Broadway, Long Branch, N. J.
Martin, Ralph H., 2300 East 52nd St., Los Angeles 11, Calif.
Martin, Randolph M., Box 951, Nacogdoches, Texas
Martin, Richard H., 51 Nelson Place, Worcester 5, Mass.
Martin, Robert F., 4125 Garrison St., N. W., Washington 16, D. C.
*Martin, Wesley G., 6054 N. Kent Ave., Milwaukee 11, Wis.
Martz, Joseph A., 535 Riverside Ave., Wellsville, Ohio
Marvin, Philip R., Milwaukee Gas Specialty Co., Box 461, Milwaukee 1, Wis.
Marx, LeRoy, Denver Terra Cotta Co., West First Ave. and Umatilla St., Denver 9, Colo.
Maryland Glass Corp. (L. C. Roche), 2143 Wicomico St., Baltimore 30, Md.
Mason City Brick & Tile Co. (R. F. Grady, Jr.), Mason City, Iowa
Massengale, Gordon B., 2740 Porter St., N. W., Apt. 1, Washington 8, D. C.
Mathews, William J., Brockway Glass Co., Inc., Brockway, Pa.
Mathiasen, O. E., Federal Seaboard Terra Cotta Corp., Perth Amboy, N. J.
Matiste, Henry J., 2404 Highland Ave., New Castle, Pa.
Matiste, Henry, Jr., 318 Elizabeth St., New Castle, Pa.

Matson, Frederick R., Research Labs., Armstrong Cork Co., Lancaster, Pa.
Matteson, Gilbert D., 14 Belleview Place, New Rochelle, N. Y.
Matthews, Leslie G., 120 Broadway, New York 5, N. Y.
Maurer, James A., 5519 N. Lake Dr., Milwaukee 11, Wis.
Mavor, Wilfrid, Ferro Enamels (Canada), Ltd., 629 Wellington St., Ottawa, Ontario, Canada
Maxson, Elwyn L., 1526 Canada Blvd., Glendale 8, Calif.
Maxson, Elwyn L., 1526 Canada Blvd., Glendale 8, Calif.
May, L. F., Standard Ultramarine Co., Huntington 18, W. Va.
Maybaum, Paul S., Jr. (Student), 740 Avenue "C," Bayonne, N. J.
Mayer, Walter S., Mayer China Co., Beaver Falls, Pa.
Mays, George A., Niles, Calif.
*†McAfee, W. Keith, Box 391, New Castle, Pa.
McAlpine, Kenneth B., 1201 Union Ave., Brackenridge, Pa.
McBride, P. B., Porcelain Metals Corp. of Louisville, 1400 South 13th St., Louisville 10, Ky.
*McBurney, John W., National Bureau of Standards, Washington 25, D. C.
McCandless, Edward L., Linde Air Products Co., Tonawanda, N. Y.
†McCann, D. M., Akron Porcelain Co., Akron 14, Ohio
McCann, F. A., R. D. 2, Box 907, Stockton, Calif.
†McCann, Sidney W., Pfaudler Co., Rochester 4, N. Y.
McCartt, Kenneth C., 327 Crescent Ave., New Castle, Pa.
McCarty, J. E. D., Simmonds Aerocessories, Inc., 21–10 49th Ave., Long Island City 1, N. Y.
*McCauley, George V., Corning Glass Works, Corning, N. Y.
McClure, Howard C., 1808 Hutchins St., Portsmouth, Ohio
McCollom, Perry C., American Crucible Co., Shelton, Conn.
McComas, Clarence B., T. C. Wheaton Co., Millville, N. J.
McCormick, Maj. John M., 321 E. Main St., Ottawa, Ill.
McCoy, William, 634 Adair Ave., Zanesville, Ohio
McCreery, George L., 393 Highland Ave., Wadsworth, Ohio
McCreight, Louis R. (Student), 402 E. Armory Ave., Champaign, Ill.
McCrone, Elizabeth B. (Student), 185 Edgewood Ave., San Francisco 17, Calif.
McCutchen, Earl S., Art Dept., Univ. of Georgia, Athens, Ga.
McDanel, Walter W., 1471 Fourth St., New Brighton, Pa.
McDevit, William F. (Student), 185 Forest Ave., Tompkinsville, Staten Island, N. Y.
McDonald, Anna R. (Student), 600 Central Ave., Apt. 33, Alameda, Calif.
McDonald, E. F., Ingram-Richardson Mfg. Co., Beaver Falls, Pa.
*†McDougal, Taine G., A C Spark Plug Div., General Motors Corp., Flint 2, Mich.
*McDowell, J. Spotts, 4716 Bayard St., Pittsburgh 13, Pa.
*†McDowell, Samuel J., American Lava Corp., Chattanooga 5, Tenn.
†McElroy, R. H., International Clay Machinery Co., Dayton, Ohio
McFeely Brick Co. (R. R. Hendren), 816 Ligonier St., Latrobe, Pa.
McGean, Ralph L., 1106 Republic Bldg., Cleveland 15, Ohio
McGohan, G. William, American Rolling Mill Co., Middletown, Ohio
McGolpin, William C., Rm. 416, 57 Bloor St., W., Toronto 5, Ontario, Canada
McGrue, William M., 10231 Prospect Ave., Chicago 43, Ill.
McHose, L. H., Inc. (M. M. McHose), Box 47, Perth Amboy, N. J.
McHose, M. M., L. H. McHose, Inc., Box 47, Perth Amboy, N. J.
McHugh, M. J., Jr., Consolidated Feldspar Corp., 1403 Trenton Trust Bldg., Trenton 8, N. J.
McIntosh, Harold W., Hartford-Empire Co., Hartford, Conn.
*†McIntyre, G. H., Ferro Enamel Corp., 4150 East 56th St., Cleveland 5, Ohio
McKaig, W. Wallace, Cumberland Steel Co., Cumberland, Md.
McKee Glass Co. (Gerald Terrill), Jeannette, Pa.
McKee, Arthur G., & Co. (J. P. Irwin), 2300 Chester Ave., Cleveland 1, Ohio
McKee, F. W., Salem China Co., Salem, Ohio
McKendrick, Alexander, Glenboig Union Fireclay Co., Ltd., The Laboratory, Star Works, Glenboig, Lanarkshire, Scotland
McKeown, Thomas H., Box 31, Metuchen, N. J.
McKinnie, James R., 804 San Ysidro, Upland, Calif.
McLain Fire Brick Co. (W. A. Turner), 1239 Gulf Bldg., Pittsburgh 19, Pa.
McLane, James, Fredericksburg Art Pottery Co., Fredericksburg, Ohio
McLaren, Henry D., 375 Daly Ave., Ottawa, Ontario, Canada
McLaughlin, N. H., Alsey Brick & Tile Co., Alsey, Ill.
McLeod & Henry Co., Inc. (Edward J. Molloy), 357 First St., Troy, N. Y.
*†McMahon, John F., Alfred, N. Y.
McMaster, Harold A., 754 Spencer St., Toledo 9, Ohio
McMurdie, Howard F., National Bureau of Standards, Washington 25, D. C.
†McNamara, Edward P., Pfaltzgraff Pottery Co., York, Pa.
McNaughton, Ronald R., Central Tech. Library, Consolidated Mining & Smelting Co. of Canada, Ltd., Trail, British Columbia, Canada
McNeil, Kenneth D., 83 W. Third St., Corning, N. Y.
McNutt, Harold M., 724 N. Victory Blvd., Burbank, Calif.
*†McVay, T. N., School of Chemistry, Metallurgy, and Ceramics, Univ. of Alabama, University, Ala.
Meacham, Floran L., 1009 Bonnie Brae, River Forest, Ill.
Meacham, Frank, Chattanooga Glass Co., Chattanooga 10, Tenn.
Medalta Sales B. C. Reg'd. (B. A. Cunliffe), 29 W. Pender St., Vancouver, British Columbia, Canada
Medert, Warren C., 797 Deshler Ave., Columbus 6, Ohio
Meeker, R. C., Kentucky-Tennessee Clay Co., 807 City Savings Bldg., Alliance, Ohio
Meharg, Laurence, Hazel-Atlas Glass Co., 15th and Jacob Sts., Wheeling, W. Va.
Meid, William J. (Student), 409 Hill St., Kohler, Wis.
Meloy, Charles L., 55 Elm St., Apt. 2, Westfield, N. J.
Mercer, L. D., Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio
Merck, Walter J., 20 Lowell Rd., Port Washington, Long Island, N. Y.
Merriam, Jack G., 2525 East 97th Place, Chicago 17, Ill.
†Merritt, Clarence W., Box 464, Alfred, N. Y.
†Merritt, Lester M., 654 Wilson Ave., Columbus 5, Ohio
†Merry, E. B., Jr., Merry Brothers Brick & Tile Co., 415 Masonic Bldg., Augusta, Ga.
Merwin, Byron W., 2505 B, St. Clair Ave., East Liverpool, Ohio
Merz, George, Magnesita S. A., Caixa Postal 208, Belo-Horizonte, Brazil
Messimer, Laverne A., Holophane Co., Newark, Ohio
Metal & Thermit Corp. (George C. Betz), 120 Broadway, New York 5, N. Y.
Metalloy Corp. (Walter M. Fenton), 1320 Rand Tower, Minneapolis 2, Minn.
Metsch, C. G., Highland Colony, East Liverpool, Ohio
Metz, G. F., Farquhar Estates, R. D. 6, York, Pa.
Metzger, A. J., 2209 Queen City Ave., Cincinnati 14, Ohio

Mexicana de Refs., A. P. Green, S. A. (J. O. Knizek), Ferrocarriles Nacionales 200, Mexico, D. F., Mexico
Mexicana de Tubos de Albañal, S. A. (J. O. Knizek), Ferrocarriles Nacionales 200 Mexico, D. F., Mexico
Mexico Refractories Co. (C. A. Smith), Mexico, Mo.
Meyer, George W., Glenshaw Glass Co., Inc., Glenshaw, Pa.
Meyer, H. C., Foote Mineral Co., 1609 Summer St., Philadelphia 3, Pa.
Meyer, Henry E., 839 Reilly Rd., Wyoming 15, Ohio
Meyer, Henry W., 5323 Lindenwood, St. Louis 9, Mo.
†Meyer, Herbert T., 247 N. Indiana Ave., Kankakee, Ill.
Meyer, Ursula, 260 Riverside Dr., New York 25, N. Y.
Meyer, William W., U. S. Tariff Commission, Washington, D. C.
Michael, Frank L., 88 North St., Dalton, Mass.
Middleswarth, Earl T., Walnut St., Reedsville, Pa.
Middleton, George J., Gladding, McBean & Co., Lincoln, Placer County, Calif.
Mies, Doris R., 701 N. Hidalgo Ave., Alhambra, Calif.
Millen, Charles T. (Student), 553 Sherbourne St., Toronto, Ontario, Canada
Miller, Esther, State Dept. of Geology and Mineral Industries, 702 Woodlark Bldg., Portland 5, Ore.
Miller, Frank K., 89 E. First St., Corning, N. Y.
Miller, Fred W., 13 Rynda Rd., Maplewood, N. J.
Miller, Grant E. (Student), 1149 W. Jackson St., Painesville, Ohio
†Miller, James L., Johns-Manville Products Corp., Zelienople, Pa.
Miller, John B., Third Street, Lewiston, N. Y.
Miller, John W., New Castle Refractories Co., New Castle, Pa.
Miller, Jorge S., Casilla 187, Santiago, Chile
Miller, Laura L., 661 La Salle Ave., Buffalo 15, N. Y.
Miller, O. E., Pyro Clay Products Co., Oak Hill, Ohio
*Miller, Robert A., Pittsburgh Plate Glass Co., 2000 Grant Bldg., Pittsburgh 19, Pa.
Miller, William A. (Student), 125 Halstead Rd., Elizabeth 3, N. J.
Miller, William J., 7702 Edgewood Ave., Swissvale, Pittsburgh 18, Pa.
Milligan, Chester E., 4814 Loma Vista Ave., Los Angeles, Calif.
Milligan, Lowell H., Norton Co., Research Lab., New Bond St., Worcester 6, Mass.
Milliken, Edward C., 444 W. North Ave., East Palestine, Ohio
†Milliken, G. Edward, Van Ormer Brick Co., Pitcairn, Pa.
Milliken, Spencer R. (Student), Dept. of Chemistry, Univ. of Texas, Austin 12, Texas
Millman, Nathan, Huber Co., Inc., Huber, Ga.
Millsom, Walter C., W. S. Dickey Clay Mfg. Co., 607 Commerce Trust Bldg., Kansas City 6, Mo.
Millspaugh, Raymond E., 165 Walnut St., Corning, N. Y.
Mink, John D., 2014 S. Walnut St., Muncie, Ind.
Minnick, L. John, 306 Boyer Rd., Cheltenham, Pa.
Minnium, Byron B., Erie Resistor Corp., 644 West 12th St., Erie, Pa.
†Minton, G. Z., Pittsburgh Plate Glass Co., Research Lab., Creighton, Pa.
Mississippi Glass Co. (R. D. Humphreys), 200 Fifth Ave., New York 10, N. Y.
Mitchell Clay Mfg. Co. (W. F. Knoesel), 5627 Manchester Ave., St. Louis 10, Mo.
Mitchell, E. T. (Student), 224 Greenwood Circle, Decatur, Ga.
†Mitchell, Lt. Lane, 2065 N. Glebe Rd., Apt. 104, Arlington, Va.
Mitchell, M. P., Fairfacts Co., Inc., Box 374, Trenton 3, N. J.
†Mitra, H. K., 12 A Rd., East, Jamshedpur, B.N.R., India
Mochel, John M., R. D. 1, Corning, N. Y.
Mockrin, Isadore, 133 W. Northwood Ave., Columbus 1, Ohio
Modigliani, Piero, Modigliani Glass Fibers, Inc., 37th Ave. and Vernon Blvd., Long Island City 1, N. Y.
Moffat, John, Jr., 930 Stewart and Gray Rd., Downey, Calif.
Mohl, Helmuth, Palma Norte 308, Despacho 312, Mexico, D. F., Mexico
Mohr, John G., Corning Glass Works, Corning, N. Y.
Mohr, William C., 15 Bryn Mawr Rd., Forest Hills, Pittsburgh 21, Pa.
Moler Products, Ltd., Hythe Works, Colchester, Essex, England
Molloy, Edward J., McLeod & Henry Co., Inc., 357 First St., Troy, N. Y.
Monack, A. J., 155 Union Ave., Rutherford, N. J.
Mong, Lewis E., 8506 Loughborough Place, Chevy Chase, Md.
Monks, Frank E., 500 Dargan St., Pittsburgh, Pa.
Montemayor, Ponciano S., Jr. (Student), Arteaga 222 Ote., Monterrey, Nuevo Leon, Mexico
*†Montgomery, Earle T., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
*Montgomery, Robert J., Mining Bldg., Univ. of Toronto, Toronto, Ontario, Canada
Montgomery, W. A., John Inglis Co., Ltd., 14 Strachan Ave., Comm. Div., Toronto, Ontario, Canada
Moody, H. Leslie, Rookwood Pottery Div., Sperti, Inc., Beech and Kenilworth Aves., Cincinnati 12, Ohio
Mooney, Edward L., 103 Pleasant St., Norwich, N. Y.
Mooney, Kurt M., 32 Arcadia Place, Vineland, N. J.
†Mooney, William F., 300 Mountain Trail Rd., Sierra Madre, Calif.
Moore Enameling & Mfg. Co., Walter B. Moore, West Lafayette, Ohio
Moore & Munger (Murray Rushmore), 33 Rector St., New York 6, N. Y.
Moore, Carl E., John Douglas Co., 71st Street and B. & O. R. R., Cincinnati 16, Ohio
Moore, Dwight G., Ceramic Div., National Bureau of Standards, Washington 25, D. C.
†Moore, Richard S., Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh 22, Pa.
Moore, Walter B., Moore Enameling & Mfg. Co., West Lafayette, Ohio
Moran, J. J., Landis Ave. and Spring Rd., Vineland, N. J.
Moranty, Adam F., 1800 Keith Bldg., Cleveland 15, Ohio
Morell, N. L., 313 Union Bank Bldg., Bethlehem, Pa.
*Morey, G. W., Geophysical Lab., 2801 Upton St., Washington 8, D. C.
Morgan, Stuart F., 18 Cooke St., Fairhaven, Mass.
Morgan, Willard L., 735 Millbrook Lane, Haverford, Pa.
*†Morgan, William R., Westboro, Mass.
Morris, Frank, 236 Greenpoint Ave., Brooklyn 22, N. Y.
*†Morris, George D., 229 Fairfield Ave., New Castle, Pa.
Morris, T/Sgt. John L., Jr., New York, N. Y.
Morris, Paul R., Pittsburgh Plate Glass Co., Creighton, Pa.
†Morrison, Neil T., 217 Greylock Parkway, Belleville 9, N. J.
Morrison, W. S., Illinois Water Treatment Co., Rockford, Ill.
Morrow, C. T., 303 Tindall Rd., Lancaster Village, Wilmington 182, Del.
Morton Pottery Co. (William Rapp), Morton, Ill.
Morton, William A., 1317 Fulton Bldg., Pittsburgh, Pa.
Mosaic Tile Co., Zanesville, Ohio
†Moser, John L., 53 Rockhill Ave., Dayton 9, Ohio
Moser, Leo, 200 Riverside Dr., New York 25, N. Y.
Moses, Sidney A., 1739 Park Rd., N. W., Apt. 1, Washington 10, D. C.
Mosley, Norman B., 85 East 18th Ave., Columbus 1, Ohio
†Moss, Vernon W., Box 223, Lompoc, Calif.
Mosthaf, Edwin, 363 Lincoln Ave., Orange, N. J.
Motock, George T., 3001 East 128th St., Cleveland 20, Ohio
Motsch, Fred R., Foster-Forbes Glass Co., Marion, Ind.
Mott, B. H., Mott Core Drilling Co., Huntington, W. Va.
Mould, W. J., Steubenville Pottery Co., Steubenville, Ohio

Mount Clemens Pottery Co. (C. E. Doll), Mount Clemens, Mich.
Mouraud, Paul H., National Tile Co., Anderson, Ind.
Mowrey, Fred W., 405 Jones St., Belle Vernon, Pa.
Moyer, Robert E., 234 Mulberry St., Coshocton, Ohio
Mueller, R. M., Ferro Enamels (Australia) Pty., Ltd., Bourke Rd., Alexandria, N. S. W., Australia
Mullady, Russell E., 459 E. High Ave., New Philadelphia, Ohio
Muller, Frederick W., 139 N. Duke St., Lancaster, Pa.
†Muller, Max M., Titan Abrasives Co., 1404 West 59th, Chicago, Ill.
Mullite Refractories Co. (Charles W. Fyfe), Shelton, Conn.
†Mulroy, James P., 965 Lafayette Ave., Buffalo 9, N. Y.
Mulryan, Henry, 1320 Corporation Bldg., 724 S. Spring St., Los Angeles 14, Calif.
Mulvane, O. E., Box 117, West Lafayette, Ohio
†Mundy, O. S., 426 Park Ave., Wheaton, Ill.
Munroe, George C. (Student), (missing in action), 28 Boulevard, Glen Rock, N. J.
Murchison, D. C., 230 Park Ave., New York 17, N. Y.
Murgatroyd, John B., Rockware Glass Syndicate, Ltd., 142/3 Audrey House, Ely Place, London, E.C. 1, England
Murphy, Edward P., Jr., 3253 N. Marietta Ave., Milwaukee 11, Wis.
Murphy, Remington M., 705 Avery Ave., Syracuse 4, N. Y.
Murray, Gerard A., R. D. 6, Box 512, Bessemer, Ala.
Murray, James A., Warner Co., Devault, Pa.
†Murray, Maurice A., 1505 Troupe St., Augusta, Ga.
Musselman, H. G., 2301 Tacoma St., Baltimore 30, Md.
Myers, C. H., Box 127, Salt Lake City, Utah
†Myers, Charles V., 516 N. Jefferson St., Kittanning, Pa.
Myers, E. F., Ironton Fire Brick Co., 707 Carolina Life Bldg., Box 1324, Columbia 56, S. C.
Myerson, Martin, Ideal Tooth, Inc., 90 Hamilton St., Cambridge 39, Mass.

Nagel, E. W., Wrought Iron Range Co., 5661 Natural Bridge Ave., St. Louis 20, Mo.
Nakamura, H. Henry (Student), 1375 East 57th St., Chicago 37, Ill.
*Nash, Harold S., Univ. of Cincinnati, Ceramics Dept., Cincinnati 21, Ohio
Nash, Simeon, Jr., 156 South 17th St., Columbus 5, Ohio
National Ceramic Co. (Nicholas H. Snyder), 400 Southard St., Trenton 2, N. J.
National Engineering Co. (E. A. Petersen), 549 W. Washington Blvd., Chicago 6, Ill.
National Fireproofing Corp. (R. A. Shipley), 202 E. Ohio St., Pittsburgh 12, Pa.
National Gypsum Co. (J. Fred Chambers), Luckey, Ohio
National Industrial Sand Assn. (V. P. Ahearn), 951 Munsey Bldg., Washington 4, D. C.
National Lead Co. (Alexander Stewart), 105 York St., Brooklyn 1, N. Y.
National Lime and Stone Co. (L. G. Love), First National Bldg., Findlay, Ohio
National Mortar & Supply Co. (E. F. Kearins), 1520 Grant Bldg., Pittsburgh, Pa.
National Refractories Co., Inc. (R. A. Hitchins), 1520 Locust St., Philadelphia 2, Pa.
National Sales Corp. (Frank Koch), 31 E. Thirteenth St., Cincinnati 10, Ohio
National Sanitary Co. (L. A. Bateman), Salem, Ohio
*Navias, Louis, Research Lab., General Electric Co., Schenectady 5, N. Y.
Nederlandsche Vereeniging van Aardewerkfabrikanten, W. P. M. van der Loo, Parkstraat 37a, The Hague, Holland
Neel, Byrd M., Bradford Woods, Pa.
Neely, Homer E., Jr., 818 Mifflin Ave., Wilkinsburg, Pa.
Neff, Edward D., Box 205, Templeton, Pa.
Neiman, Robert, Whip-Mix Corp., Inc., 411 W. Avery Ave., Louisville 8, Ky.
Nelson, Forrest W., 11 Luther St., Lacey Park, Hatboro, Pa.
Nelson, Lewis W., 923 Hazel St., New Castle, Pa.
Nelson, Quentin E. (Student), c/o Mrs. T. E. Livingston, 522 S. E. Main St., Portales, N. Mex.
New, Ryland H., National Sewer Pipe Co., Ltd., Swansea, Ontario, Canada
Newbold General Refractories, Ltd., Box 3407 R, Sydney, N. S. W., Australia
Newbrander, Stanley M., Weirton Steel Co., Weirton, W. Va.
New Castle Refractories Co. (R. W. Rowland), New Castle, Pa.
†Newcomb, Rexford, Jr., 276 Continental Ave., River Edge, N. J.
Newhouse, Henry, 4103 Third Rd., N., Apt. 1, Buckingham Community, Arlington, Va.
New Jersey Porcelain Co. (Stephen Wenczel), Box 908, Trenton 5, N. J.
Newman, Robert W., Buffalo Tube Works, General Electric Co., 1495 Filmore Ave., Buffalo 11, N. Y.
Newsom, A. S., Pountney & Co., Ltd., Bristol Pottery, Fishponds, Bristol, England
Newton, R. L., Owens-Illinois Glass Co., Bridgeton, N. J.
Nichols, A. S., 608 S. Dearborn St., Chicago 5, Ill.
Nichols, E. H., Funkhouser Co., 138 W. Washington St., Hagerstown, Md.
Nicholson, Clifford M., Ancor Corp., Box 565, St. George, S. C.
Nicks, John F., 28 Woburn Ave., Toronto, Ontario, Canada
Nieman, A. H., Ohio Hydrate & Supply Co., Woodville, Ohio
Nile, Hugh, Industrial Filter Sack Co., Wellsville, Ohio
Nobes, Frederick L., Carborundum Co., Ltd., Manchester, England
Noble, O. C., Tygart Valley Glass Co., Washington, Pa.
Nobles, Melvin A. (Student), Box 483, Corning, N. Y.
Nodurft, Edgar G. (Student), Strawberry Point, Iowa
Nonporite Pty., Ltd. (Norman Griffiths), 292–296 Burwood Rd., Hawthorn E. 2, Victoria, Australia
Nordberg, Martin E., 244 Chenning St., Corning, N. Y.
Nordmeyer, Rudy L., Mission, Texas
Nordyke, John S., 434 Olympia Rd., Chatham Village, Pittsburgh, Pa.
North American Refractories Co. (E. M. Weinfurtner), National City Bank Bldg., Cleveland 14, Ohio
North Carolina Feldspar Corp. (W. F. Deneen), Erwin, Tenn.
North State Pyrophyllite Co., Inc. (E. M. Harvey), Pomona, N. C.
Northwestern Glass Co. (Edward S. Campbell), 5801 E. Marginal Way, Seattle 4, Wash.
Norton Co. (Arthur T. Malm), Worcester 6, Mass.
*Norton, Charles L., Jr., Babcock & Wilcox Co., 85 Liberty St., New York 6, N. Y.
*†Norton, Frederick H., Dept. of Metallurgy, Div. of Ceramics, Massachusetts Inst. of Tech., Cambridge 39, Mass.
Norwood, George M., Box 275, Lillington, N. C.
Norwood, J. Nelson, Alfred Univ., Alfred, N. Y.
Novinski, Frank S., 1161 Sheridan St., Camden, N. J.
Novy, Anton R., 2818 S. Wisconsin Ave., Berwyn, Ill.
Noyes, Bradford, P. R. Mallory & Co., Indianapolis, Ind.
Nunes, J. L. (missing in action), 359 6th St., N. E., Atlanta, Ga.
Nyman, P. V., Ball Brothers Co., Muncie, Ind.
Nyquist, Roy A., 3650 Beechway Blvd., Toledo 9, Ohio

*Oakley, W. W., 31 East 4th St., Corning, N. Y.
O'Bannon, Loran S., 1215 Parkway, N., Columbus 8, Ohio
Oberst, Clair R., Industrial Ceramic Products, Inc., 965 W. Fifth Ave., Columbus 8, Ohio

Odelberg, A. S. W. (Honorary), Allen 18, Djursholm, Sweden
Oertel, Paul J., Owens-Illinois Glass Co., 601 36th Ave., Oakland 1, Calif.
Oesterle, Robert A., 2427 W. Main, Belleville, Ill.
Offill, P. M., Amsler-Morton Div., Union Mining Co., Fulton Bldg., Pittsburgh 22, Pa.
Offutt, J. S., United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.
Ogden, D. P., Ogden Engr. Co., Ottawa, Ill.
*Ogden, Ellsworth P., Harrop Ceramic Service, 35 E. Gay St., Columbus, Ohio
*Ogden, John T., *The Glass Industry*, 55 West 42nd St., New York 18, N. Y.
Ohio Brass Co., Barberton, Ohio
Ohio Clay Co. (George W. Denison), Box 1776, Cleveland 5, Ohio
Ohio Hydrate & Supply Co. (A. H. Nieman), Woodville, Ohio
Old Hickory Clay Co. (L. F. Powell), Box 271, Paducah, Ky.
Olive, Frank C., 515 Chamber of Commerce Bldg., Indianapolis 4, Ind.
Oliver, W. V., French Saxon China Co., Sebring, Ohio
Olney, Wilson, Rm. 809A, 89 Broad St., Boston, Mass.
Olpin, Albert R., 2045 Wickford Rd., Columbus 8, Ohio
Olsen, Rangwald S., 1938 Estes Ave., Chicago 26, Ill.
Olson, E. E., A. H. Heisey & Co., Newark, Ohio
Olson, Hjalmar, A. B. Gustavsbergs Fabriks, Intressenter, Gustavsberg, Stockholm, Sweden
O'Meara, Robert G., 1400 Elm St., Rolla, Mo.
Onondaga Pottery Co. (B. E. Salisbury), 1856–58 W. Fayette St., Syracuse 4, N. Y.
Opper, F. H., Savannah Kaolin Co., 314 American Bldg., Box 184, Savannah, Ga.
Orefraction, Inc. (John F. Hunt), 7505 Meade St., Pittsburgh 8, Pa.
Orlando, Antonio, Ferrosmalt, S. A., Avenida 18, Julio 1202, Montevideo, Uruguay
Orr, Stanley C., Pfaudler Co., Elyria, Ohio
Orth, Howard S., Industrial Ceramic Products, Inc., 965 W. 5th Ave., Columbus 8, Ohio
*†Ortman, Fred B., Gladding, McBean & Co., 2901 Los Feliz Blvd., Los Angeles 26, Calif.
Orton, Edward, Jr., Ceramic Foundation, 1445 Summit St., Box 146, Sta. A, Columbus 1, Ohio
Ostrander, Eugene C., Kopp Glass, Inc., Box 8255, Swissvale, Pittsburgh 18, Pa.
Ostrander, Van R., 10 Judson Ave., Ardsley, N. Y.
Ott, Lawrence H., Rheem Mfg. Co., Research Div., 1209 East 25th St., Baltimore 18, Md.
Ottoson, Axel C., 4163 Trumbull St., Bellaire, Ohio
Outcault, Harry E., St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
Overbeck, Mary F., 520 E. Church St., Cambridge City, Ind.
Owen, F. E., Porcelain Products, Inc., Parkersburg, W. Va.
Owen, Frederick E., Electrical Refractories Co., East Palestine, Ohio
Owen, J. D., R. Fowler, Ltd., Fitzroy St., Marrickville, Sydney, N. S. W., Australia
Owen, Robert I. (Student), 48 Broad St., Freehold, N. J.
Owens-Corning Fiberglas Corp. (F. V. Tooley), Newark, Ohio
Owens-Illinois Glass Co. (W. A. Mahaffy), 601 36th Ave., Oakland 1, Calif.
Owens-Illinois Glass Co. (E. W. Summers), General Engr. Dept., Alton, Ill.

Pacific Clay Products (Roy Lacy), Box 145, Sta. A, Los Angeles 31, Calif.
Pacific Coast Borax Co. (F. T. Winters), 51 Madison Ave., New York 10, N. Y.
†Packman, Willard D., 1145 Confer Ave., Johnstown, Pa.
Paddock, Laura S., Rowantrees Kiln, Blue Hill, Maine
Paden City Pottery Co. (Merrill C. Sondles), Paden City, W. Va.
Pafford, Ray W., Acme Brick Co., Fort Worth 2, Texas
Palmer, Gus, Jr., Box 527, Salisbury, N. C.
Palmer, Joseph D., 5827 Buffalo Ave., Niagara Falls, N. Y.
Palmer, Rufus N., Mellon Inst., 4400 5th Ave., Pittsburgh 13, Pa.
Palmer, W. E., Taylor, Smith & Taylor Co., Chester, W. Va.
†Palmer, Willard E., 545 Henry Ave., East Liverpool, Ohio
Paper Makers Importing Co., Inc. (Charles Brian), Drake Bldg., Rm. 504, Easton, Pa.
Paquette, Cyril T., 315 W. Pulteney St., Corning, N. Y.
Parisa, Alice (Student), 154 Yerba Buena St., San Francisco 8, Calif.
Park, Frank A., Jr., 309 E. Boyles Ave., New Castle, Pa.
Parker, Charles J., Corning Glass Works, Corning, N. Y.
Parker, Harry (Student), Box 72, Irving, N. Y.
Parkhurst, Howard M., General Refractories Co., 1407 Oliver Bldg., Pittsburgh 22, Pa.
Parks, Cornelia C., 307 Swarthmore Rd., Glassboro, N. J.
Parmelee, Clifford H., 214 Warham St., Syracuse 8, N. Y.
*†Parmelee, C. W. (Life), Univ. of Illinois, Urbana, Ill.
Parnham, H., General Refractories, Ltd., Worksop, England
Parsons, Joseph R., 1253 Diversey Parkway, Chicago 14, Ill.
†Pask, Joseph A., Research Dept., Lamp Div., Westinghouse Electric Corp., Bloomfield, N. J.
Pasquier, A. L., Franklin Glass Corp., Box 150, Butler, Pa.
Pass & Seymour, Inc. (R. H. Pass), Solvay, N. Y.
Pass, James S., 1650 James St., Syracuse 6, N. Y.
Pass, R. H., Onondaga Pottery Co., Syracuse 4, N. Y.
Patch, James B., 206 Howard St., Millville, N. J.
Pate, Dorothy R., Box 467, Norris, Tenn.
Patriarca, Armando S. E., Alvarado 1146, Buenos Aires, Argentina
Pauling, June A., 633 N. Sycamore Dr., San Gabriel, Calif.
Pavlish, Arnold E., Battelle Memorial Inst., 505 King Ave., Columbus, Ohio
Pavliuchenko, V. I., Soviet Purchasing Commission, 210 Madison Ave., New York 16, N. Y.
Paxton, E. W., Mississippi Glass Co., Main and Angelica Sts., St. Louis 7, Mo.
Pearce, Charles S., The American Ceramic Society, Inc., 2525 N. High St., Columbus 2, Ohio
Pearch, William M., Akron Porcelain Co., Akron 14, Ohio
Pearlman, Sam B., 1027 Metropolitan Ave., Brooklyn, N. Y.
Pearson, Edward P., Basic Refractories, Inc., Maple Grove, Ohio
Pearson, E. J. & J., Ltd. (C. W. Thomas), Firebrick Works, Stourbridge, England
Peck, J. Clair, Hanley Co., Summerville, Pa.
Peck, J. E. (Student), 1342 Carlotta St., Berkeley 3, Calif.
Peck, Richard M., Box 273, Alfred, N. Y.
Peel, Fred P., 11777 Minden, Detroit 5, Mich.
Pei, V. K., 169 East 4th St., Corning, N. Y.
*Peiler, Karl E., Hartford-Empire Co., Box 1620, Hartford 1, Conn.
Pemco Corp. (Richard Turk), 5601 Eastern Ave., Baltimore 24, Md.
*†Pence, F. K., Ceramic Engr., Univ. of Texas, Austin 12, Texas
Pennsylvania Bottle Co. (William Gallagher), 311 Horton Ave., Sheffield, Pa.
Pennsylvania Pulverizing Co. (William J. Woods), Box 587, Lewistown, Pa.
Pennsylvania Salt Mfg. Co. (R. S. Roeller), 1000 Widener Bldg., Philadelphia 7, Pa.
Penzickes, John, 273 Commonwealth Ave., Springfield 8, Mass.

Peralta, Hector A., Sidar y Rovirosa 100, Mexico, D. F., Mexico
Pereira, Armando de Arruda, Caixa Postal 1930, São Paulo, Brazil
Pereny, Andrew, Pereny Equipment Co., 842 N. Pearl St., Columbus 8, Ohio
Perkins, Harrell L., Central of Georgia Ry., Rhodes-Haverty Bldg., Atlanta 2, Ga.
Perkins, Walter W., 600 De Witt St., Linden, N. J.
Perry, John A. (Student), 801 Colony St., Saskatoon, Saskatchewan, Canada
Perry, Robert F., Victor Insulators, Inc., Victor, N. Y.
Pertuch, Walter A. R., Franklin Inst., Philadelphia 3, Pa.
Peskin, William L., 147 Rossiter Rd., Rochester 7, N. Y.
Pesses, Marvin (Student), 2401 21st Ave., Rock Island, Ill.
Petersen, E. A., National Engineering Co., 549 W. Washington Blvd., Chicago 6, Ill.
Petersen, Fred A., Univ. of Illinois, Dept. of Ceramics, Urbana, Ill.
Peterson, L. W., The Library, Solvay Process Co., Syracuse 1, N. Y.
Peterson, W. H., M. D. Valentine & Brothers Co., Woodbridge, N. J.
†Petrie, Earl C., North American Refractories Co., National City Bank Bldg., Cleveland 14, Ohio
Petrie, Lloyd R., 404 W. Snyder St., Abingdon, Ill.
Pettinos, George F., Inc. (George F. Pettinos, Sr.), 1206 Locust St., Philadelphia 7, Pa.
Pettinos, George F., Sr., George F. Pettinos, Inc., 1206 Locust St., Philadelphia 7, Pa.
Petts, Omer F., 2713 Ashland Ave., Baltimore 5, Md.
Petty, Ens. Howard E., U.S.N.R., c/o Andrew Fritsch, R. D. 2, Amherst, Ohio
Pfaeffli, W. U., Strong Mfg. Co., Sebring, Ohio
Pfaudler Co. (O. I. Chormann), 89 East Ave., Rochester 4, N. Y.
Pfeiff, C. H., Box 527, Metuchen, N. J.
*†Pfeiffer, Wilbur H., Engr. Lab., Plant 2, Frigidaire Div., General Motors Corp., Dayton 1, Ohio
Pfleger, George E., Harshaw Chemical Co., 2424 Enterprise St., Los Angeles, Calif.
Phadake, V. S., Central Potteries, Ltd., Nagpur, India
Phelps, Girard W., 399 Massachusetts Ave., Trenton 9, N. J.
*Phelps, Stuart M., Mellon Inst., Pittsburgh 13, Pa.
Phillips, Gordon D., Olean Tile Co., Olean, N. Y.
†Phillips, James G., Mines Branch, Sussex St., Ottawa, Ontario, Canada
Phillips, William E., Duplate Canada, Ltd., Oshawa, Ontario, Canada
Phillipson, E. G., Box 144, Medicine Hat, Alberta, Canada
Philpot, A. J., British Scientific Instrument Research Assn., 26 Russell Sq., London, W. C. 1, England
Pickard, Henry A., Pickard, Inc., Corona Ave., Antioch, Ill.
Pieper, Arthur O., 105 Trevor Court Rd., Rochester 10, N. Y.
Pierce Glass Co. (H. C. Herger), Port Allegany, Pa.
Pierce, J. Allen, 115 E. Market St., Bethlehem, Pa.
Pierce, Robert H. H., Jr., Research Lab., U. S. Steel Corp., Kearny, N. J.
Pike, Robert D., 342 S. Highland Ave., Pittsburgh, Pa.
Pincus, Alexis, American Optical Co., Southbridge, Mass.
Pinnow, Harley R., Orangeville, Ill.
Pinotti, Fred D., 1010 New Pear St., Vineland, N. J.
Pitcairn, William S., 212 Fifth Ave., New York 10, N. Y.
Pitcock, Lawrence, Crooksville, Ohio
Pittman, Jack, Box 986, Lewistown, Mont.
Pittsburgh Plate Glass Co. (C. E. Fulton), Creighton, Pa.
†Place, Tom M., 176 Moross Ave., Mount Clemens, Mich.
Plagge, Vernon L., 459 Park Ave., East Orange, N. J.
†Planje, Christian W., Gladding, McBean & Co., 1275 Harrison St., San Francisco 3, Calif.
Plank, Ross D., 2835 Shadow Lawn Ave., Los Angeles 26, Calif.
Plankenhorn, W. J., Federal Electric Co., 8700 S. State St., Chicago 19, Ill.
Platt, Donald L., "Endcliffe," Granville Ave., Newcastle-u-Lyme, North Staffordshire, England
Pleasants, Luther E., Jr. (Student), 3101 North Ave., Richmond 22, Va.
Plibrico Jointless Firebrick Co. (W. A. Schaefer), 1800 Kingsbury St., Chicago 14, Ill.
Ploetz, Edwin C. H., Bloomer, Wis.
Pluess, Otto, 1336 First National Bldg., Box 1314, Oklahoma City 1, Okla.
*Plummer, Harry C., Structural Clay Products Inst., 1756 K Street, N. W., Washington, D. C.
Plummer, Norman, State Geological Survey of Kansas, Lawrence, Kans.
*†Plusch, H. A., 1014 Oak Lane, Philadelphia 26, Pa.
Plusch, John A., 2 Woodland Rd., Westfield, Mass.
Polan, Albert, Zenith Optical Co., 832 Court St., Huntington, W. Va.
Polaroid Corp. (D. B. Hummel), 211 Massachusetts Ave., Cambridge 39, Mass.
†Pole, Gordon R., R. D. 10, White Bear Branch, St. Paul 10, Minn.
Poles, Alfred, 23 Prospect St., Trenton 8, N. J.
Polhemus, D. Worth, Lake Shore Dr., Harbor Hills, Ohio
Polivka, Jar, 1150 Arch St., Berkeley 8, Calif.
Polk, Arthur E., 3901 S. Morgan St., Chicago 9, Ill.
Pomeroy, W. T., Sterling China Co., East Liverpool, Ohio
Pond, Marvin H., 48 W. School St., Westfield, Mass.
Ponomareff, I. F., Rabotshaja Ulitza 125, Industrialny Institut, Novotsherkassk, U.S.S.R.
Poole, James P., Ceramics Dept., Pennsylvania State College, State College, Pa.
Poor, Mary Eleanor, Box 378, Norris, Tenn.
Porcelain Metals Corp. of Louisville (P. B. McBride), 1400 South 13th St., Louisville 10, Ky.
Porcelain Products, Inc. (John G. Loy), Box 300, Findlay, Ohio
Porst, Edward G., 51 E. Randall St., Baltimore, Md.
†Porter, Frank R., 318 E. Clark St., Crown Point, Ind.
Porter, Garnett H., 54 Pomeroy Ave., Pittsfield, Mass.
Porter, Rudyard, Carnegie-Illinois Steel Corp., 208 S. La Salle St., Rm. 1789, Chicago 90, Ill.
Porter, Sidney C., Globe Brick Co., East Liverpool, Ohio
Portsmouth Clay Products Co., Inc. (H. S. Davis), Portsmouth, Ohio
†Post, Alfred J. (Student), Box 7314, Sta. L., Los Angeles 23, Calif.
*†Poste, Emerson P., 309 McCallie Ave., Chattanooga 3, Tenn.
Postlewaite, Donald E., Universal Sanitary Mfg. Co., Camden Div., Camden, N. J.
Potter, John F., Bell Telephone Lab., Murray Hill, N. J.
Potters Supply Co. (Dewitt D. Irwin), East Liverpool, Ohio
*Potts, Amos P., 359 E. Main St., Logan, Ohio
Poulton, Robert F., 2763 N. Congress Rd., Camden, N. J.
Powell, Arthur L. (Student), 494 Concord Ave., New York 55, N. Y.
Powell, L. F., Old Hickory Clay Co., Box 271, Paducah, Ky.
Powell, O. E., Indiana Drain Tile Co., Inc., Brooklyn, Ind.
Powell, Richard E., Frick Chemical Lab., Princeton, N. J.
Power, Henry R., Carborundum Co., Niagara Falls, N. Y.
Power, Laurence E., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Pozefsky, Abbott (Student), 104 Forest St., Gloversville, N. Y.
Precision Grinding Wheel Co., Inc. (George F. Kohn), 8301 Torresdale Ave., Philadelphia 36, Pa.

Prentice, William J., Jr. (Student), 839 Columbian Ave., Oak Park, Ill.
Prescott, Frank R., 207 Washington St., Latrobe, Pa.
Presswood, Colin, Oaklands, Aberaman, Aberdare, Glamorganshire, Wales
Preston, Frank W., Box 847, Butler, Pa.
Pretoria Glass Works (I. Donen), Box 863, Pretoria, South Africa
Prey, Arthur H., Carborundum Co., Niagara Falls, N. Y.
Price, Glen M., General Refractories Co., Box 1673, Baltimore 3, Md.
Price, Warren L., 162 Cedar St., Corning, N. Y.
Priddy, K. O., Barium Reduction Corp., South Charleston, W. Va.
Priestley, Joseph E., "Desia," Haggstones Rd., Worrall, Sheffield, England
Primm, Herbert E., 103 E. Second St., Los Altos, Calif.
†Prior, Harold D., 221 Parkside Rd., Plainfield, N. J.
†Proe, Joseph A., Jr., 717 Main St., Niagara Falls, N. Y.
Prokopec, James (Student), 258 W. Ninth St., Elmira Heights, N. Y.
Promat Div., Poor & Co. (A. E. Chester), 851 S. Market St., Waukegan, Ill.
Prutton, Carl F., Case School of Applied Science, U. C. Sta., Cleveland 6, Ohio
Pryor, Edward K., 1814 Hess Blvd., Columbus, Ohio
Psemeneki, Pvt. Edward D., Oak Ridge, Tenn.
Puerto Rico Clay Products Corp. (W. J. Stubbins), Box 4083, San Juan 20, Puerto Rico
Pulkingham, W. G., Sovereign Potters, Ltd., Hamilton, Ontario, Canada
Pupulidy, Alexander, 34-18 91st Street, Apt. A 41, Jackson Heights, Long Island, N. Y.
Purcell, Burnette, Northwestern Terra Cotta Corp., 1750 Wrightwood Ave., Chicago 14, Ill.
*†Purdy, Ross C. (Honorary), The American Ceramic Society, Inc., 2525 N. High St., Columbus 2, Ohio
Purinton Pottery Co. (B. S. Purinton), Shippenville, Pa.
Purinton, B. S., Purinton Pottery Co., Shippenville, Pa.
Pyro Clay Products Co. (O. E. Miller), Oak Hill, Ohio

Quigley Co., Inc. (R. J. Demaison), 527 Fifth Ave., New York 17, N. Y.
†Quirk, John F., 111 E. Dayton St., Flint 5, Mich.

Rabe, N. A., 10 W. Palmer Ave., Collingswood, N. J.
Rabin, William J. (Student), Fairmont House, East, Box 379, State College, Pa.
Rabinowitz, Joel (Student), 640 West 170th St., New York 32, N. Y.
Raghunath, N. V., Government Porcelain Factory, Malleswaram P. O., Bangalore City, India
†Raine, Frank F., 19 Clifton St., Pittsburgh 10, Pa.
Rainwater, Charles, P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis 6, Ind.
Rait, J. R., William Jessop & Sons, Ltd., Brightside Works, Sheffield, England
*Ralston, O. C., U. S. Bureau of Mines, Washington 25, D. C.
Ramm, Eric, H. L. Brisbane & Wunderlich, Ltd., Lord St., East Perth, West Australia
Ramsden, C. E., C. E. Ramsden & Co., Foley Colour & Chemical Works, Fenton, Stoke-on-Trent, England
Ramtite Co. (Louis J. Jacobs), 2563 West 18th St., Chicago 8, Ill.
Randall, Ruth H., 110 Lynbrook Circle, DeWitt, N. Y.
†Rankin, James E., 624 Mulberry St., Statesville, N. C.
Rankin, James J., St. Joseph Lead Co., Box 97, Monaca, Pa.
Ransome Machinery Co. (J. C. Lukas), Dunellen, N. J.
†Rapp, Carl H., Globe-Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis.
Rapp, William, Morton Pottery Co., Morton, Ill.
Ratcliffe, Temple W., 415 South Ave., W., Westfield, N. J.
Ray, John G., 329 Wellington Rd., Mineola, Long Island, N. Y.
Razey, Robert M., 486 Ashland, Detroit 15, Mich.
Rea, Robert F., Universal Zonolite Insulation Co., 135 S. La Salle St., Chicago 3, Ill.
Read, Edgar B., 6-427 Massachusetts Inst. of Tech., Cambridge 39, Mass.
Reagan, Cornelius J. (Student), 612 N. Third St., Steelton, Pa.
Redlich, Paul L., 562 Washington Blvd., Chicago 6, Ill.
Redman, William S. (Student), 613 Glebeholme Blvd., Toronto, Ontario, Canada
Redshaw, H., Hamilton Potteries, Ltd., 100 Locke St., S., Hamilton, Ontario, Canada
Reed, Carl E., 1326 E. Main St., Lancaster, Ohio
Reed, Dean, 334 E. North St., New Castle, Pa.
Reed, F. E., Glass Co., 860 Maple St., Rochester, N. Y.
Reed, Henry M., 106 Dickson Ave., Ben Avon, Pittsburgh 2, Pa.
†Reed, Herold N., 416 W. Laurel St., Willard, Ohio
Reed, Paul H. (Student), Hegins, Pa.
Reents, Hildred, 1149 E. Palm Ave., San Gabriel, Calif.
Reese, L. P., Scio-Ohio Pottery Co., Scio, Ohio
Refractory & Insulation Corp. (Christopher Branda), Port Kennedy, Pa.
Reid, Harry F., Jr., 233 W. King Ave., Columbus 1, Ohio
Reid, John H. (Student), 65 Kingsway Crescent, Toronto, Ontario, Canada
†Reid, John O., Box 273, Alfred, N. Y.
Reider, K. G., Lamp Dept., Glass Mfg. Div., General Electric Co., Nela Park, East Cleveland 12, Ohio
Reif, Richard E., 62 Washington Ave., Box 289, Berlin, N. J.
Reik, Richard, 212 Carmel Ave., Piedmont 11, Calif.
†Reimer, John J., 5314 First St., N. W., Washington 11, D. C.
Reimers, John C., Pfaudler Co., Taylor St., Elyria, Ohio
Reimert, R. C., Paper Makers Importing Co., Inc., Drake Bldg., Easton, Pa.
Reinker, Gerald E., General Electric Co., Lamp Dept., 1133 East 152nd St., Cleveland 10, Ohio
Reiss, Pvt. Max S., Butler, Pa.
Remington, Victor H., B. F. Drakenfeld & Co., Inc., Washington, Pa.
*Remmey, G. Bickley, Richard C. Remmey Son Co., Hedley St. and Delaware River, Philadelphia 37, Pa.
Remmey, John G., Richard C. Remmey Son Co., Hedley St. and Delaware River, Philadelphia 37, Pa.
Remmey, Richard C., Son Co. (G. Bickley Remmey), Hedley St. and Delaware River, Philadelphia 37, Pa.
Remy, Marc E. de B., 365 Redfern Ave., Westmount, Quebec, Canada
Republic Stamping & Enameling Co. (P. A. Mallonn), Box 471, Canton 1, Ohio
Republic Steel Corp. (L. D. Mercer), Republic Bldg., Cleveland 1, Ohio
Resek, Stephen, 1064 Woodbury Rd., New Kensington, Pa.
Reuter, Malvern M., 1600 Alum Creek Dr., Columbus 9, Ohio
Rhea, Walter A., Box 206, Alpena, Mich.
Rhodes, Daniel, 192 Oak Court, Palo Alto, Calif.
Rhodes, Foster T., Onondaga Pottery Co., Syracuse 4, N. Y.
†Rhodes, Ralph R., 1729 Powell St., Norristown, Pa.
*†Rice, Bryan A., 210 Hollywood Ave., Rochester, N. Y.
Rice, George A., 1411 State St., Schenectady 4, N. Y.
Rice, Hal H., Westinghouse Electric Corp., Research Labs., Ardmore Blvd., East Pittsburgh, Pa.
Rice, Murray J., 133 N. Main St., Alfred, N. Y.
Richardson, H. K., Westinghouse Lamp Div., Westinghouse Electric Corp., Bloomfield, N. J.
†Richmond, J. C., 4520 43rd Place, N. W., Washington 16, D. C.

Ricker, Richard W., Libbey-Owens-Ford Glass Co., Vitrolite Div., Parkersburg, W. Va.
Riddell, W. A., Co. (L. A. Henderson), Bucyrus, Ohio
*†Riddle, Frank H., 1420 Strathcona Dr., Detroit 3, Mich.
Riddle, Robert F., 1801 Arrott Bldg., Pittsburgh 22, Pa.
Riegger, Harold E., C.P.S. Camp 94, Trenton, N. Dak.
Riehl, W., Hanovia Chemical & Mfg. Co., Chestnut St. and N.J.R.R. Ave., Newark 5, N. J.
Rieke, Reinhold (Honorary), Royal Porcelain Factory, Berlin, Germany
*Ries, H. (Honorary, Charter Life), 401 Thurston Ave., Ithaca, N. Y.
Rigterink, Merle D., Bell Telephone Labs., Murray Hill, N. J.
Riis, 'Asgeir, Robeson Process Co., 500 Fifth Ave., New York 18, N. Y.
Riley, W. G., John Walsh Walsh, Ltd., Soho & Vesta Glassworks, Birmingham 18, England
Rindone, Guy E., 418 A Lafayette St., Salem, Mass.
Ritter, Joseph S., Adamston Flat Glass Co., Clarksburg, W. Va.
Roberts, Arthur H., 1208 Eastern Parkway, Brooklyn, N. Y.
Roberts, William, John G. Stein & Co., Ltd., Manuel, near Linlithgow, Scotland
Robertson, Campbell, E. I. du Pont de Nemours & Co., Inc., Perth Amboy, N. J.
Robertson, Leon F., 900 Main St., Brockway, Pa.
Robertson, Randal K., 906 University Tower Bldg., Montreal, Quebec, Canada
Robeson Process Co. ('Asgeir Riis), 500 Fifth Ave., New York 18, N. Y.
Robinson Ventilating Co. (Robert R. Robinson), Zelienople, Pa.
Robinson, Alfred W., 2624 East 77th St., Chicago 49, Ill.
Robinson, Gilbert C., Church St., Cooleemee, N. C.
†Robinson, G. R., 224 Mound St., Logan, Ohio
Robinson, Louis G., Louis G. Robinson Labs., Box 167, Cincinnati 1, Ohio
Robinson, M. R., Robinson Ventilating Co., Zelienople, Pa.
Robinson, Phillip, 26 E. Crescent St., McMahons Pt., Sydney, N. S. W., Australia
Robinson, Robert R., Robinson Ventilating Co., Zelienople, Pa.
Robson, H. L., Box 56, Lewiston, N. Y.
*†Robson, James T., Allied Engr. Co., 4150 East 56th St., Cleveland, Ohio
*Roche, Louis C., Maryland Glass Corp., 2143 Wicomico St., Baltimore 30, Md.
Rochow, W. F., Harbison-Walker Refractories Co., Pittsburgh 22, Pa.
Rodefer, H. H., Box 550, Bellaire, Ohio
Rodgers, Joseph P., Seaboard Feldspar Co., 4214 Connecticut Ave., Baltimore, Md.
Rodgers, Rand, Alton Brick Co., Alton, Ill.
Rodman, Clarence J., Box 809, Alliance, Ohio
Rodriguez, Antonio R., Dept. of Chemistry, Rm. 311, Univ. of Illinois, Urbana, Ill.
*†Roehm, Victor J., 2320 Ridgewood Ave., Alliance, Ohio
Roeller, R. S., Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.
Roff, W. Wallace, 14 Glenside Dr., West Orange, N. J.
Rogers, Edwin J., Marshall-Eclipse Div., Bendix Aviation Corp., Troy, N. Y.
Rogers, Gregory L., 2901 Los Feliz Blvd., Los Angeles 26, Calif.
Rolke, Herbert J., Sociedade de Engenharia Industrial, Rua Marconi, 23, 8° andar, São Paulo, Brazil
Rollason, E. C., Murex Welding Processes, Ltd., Hertford Rd., Waltham Cross, Hertfordshire, England
†Rollfs, Edward H., 89 Homesdale Ave., Southington, Conn.
Rolph, Thomas W., Holophane Co., Inc., Newark, Ohio
Rookwood Pottery Div., Sperti, Inc. (H. Leslie Moody), Beech and Kenilworth Aves., Cincinnati 12, Ohio
Rosales, Antonio H., Palma Norti 308, Mexico, D. F., Mexico
Rose, Charles R., 80 Burt St., Apt. 2, Columbus 3, Ohio
*Rosenberg, Jacob E., 789 Academy Place, Pittsburgh 16, Pa.
Rosenthal, Ernst, 246 Park West, Marble Arch, London, W. 2, England
Roseville Pottery, Inc. (Robert P. Windisch), Zanesville, Ohio
*†Ross, Donald W., U. S. Bureau of Mines, Univ. of Alabama, Tuscaloosa, Ala.
Rossell, H. A., Oxford Div., United Feldspar & Minerals Corp., West Paris, Maine
Rossetti, Jose, Rua Joaquim Nabuco 107, São Caetano S. P. R., São Paulo, Brazil
Ross-Tacony Crucible Co. (K. E. Buck), Tacony, Philadelphia 35, Pa.
Roth, H. A., Rundle Mfg. Co., 3905 River Ave., Camden, N. J.
Rothermel, Joseph J., Univ. of Rochester Medical School, Box 287, Crittenden Sta., Rochester 7, N. Y.
Roudabush, Douglas E., 107 Browning Ave., Altoona, Pa.
†Roup, Rolland, 3840 North 22nd St., Milwaukee 6, Wis.
Rowland, Davidge H., Porcelain Insulator Co., Lima, N. Y.
Rowland, Lt. R. A., Aberdeen Proving Ground, Md.
Rowland, Roger W., New Castle Refractories Co., New Castle, Pa.
Royal China, Inc. (W. H. Hebenstreit), Sebring, Ohio
Royal, Herbert F., 8525 Butler Ave., Detroit 11, Mich.
Ruck, Thomas F., 52 E. Third St., Corning, N. Y.
Rudd, Richard D., 3310 Brownsville Rd., Brentwood, Pittsburgh 10, Pa.
Rudisill, William A., 229 Chapman Place, Elmira, N. Y.
†Rue, Charles V., 224 E. Main St., Ligonier, Pa.
*Rueckel, W. C., Koppers Co., Koppers Bldg., Pittsburgh 19, Pa.
Rugg, Ormund I., 107 Oak St., River Rouge, Mich.
Rugh, Betty Anne (Student), 2778 Ridgeway Ave., Rochester 13, N. Y.
Rugh, Frank A., Jr. (Student), 205 N. Second St., Jeannette, Pa.
Rugh, Kenneth A., Garfield Refractories Co., Bolivar, Pa.
Rulon, Richard M., Clymer, N. Y.
Rundle Mfg. Co. (M. A. Dantzler), 3305 W. Forest Home Ave., Milwaukee 7, Wis.
Rupp, E. M., 410 Northridge Rd., Columbus 2, Ohio
Rushmore, Murray, Moore & Munger, 33 Rector St., New York 6, N. Y.
*†Russell, Ralston, Jr., Research Labs., Westinghouse Electric Corp., East Pittsburgh, Pa.
Russell, Robert G., 293 Buckingham St., Newark, Ohio
Russell, William H., Johns Hopkins Hospital, Baltimore 5, Md.
Rust, E. Marshall, 902 Denrike Bldg., 1010 Vermont Ave., N. W., Washington 5, D. C.
Rust, Vernon N., 3601 Santa Fe Ave., Los Angeles 11, Calif.
Rustless Iron Co., Ltd. (H. Whitaker), Trico Works, Keighley, England
Ryan, Joseph D., 3018 Middlesex Dr., Toledo 6, Ohio
Ryan, Rosemary, 2405 Glendale Blvd., Los Angeles 26, Calif.
Ryland, Harold W., 1701 Washington Ave., Golden, Colo.
Rynders, Gerald F. (Student), 109 Glen Ave., Elmira, N. Y.

Sada, Roberto G., Jr., Verlaine 702, Colonia Obispado, Monterrey, N. L., Mexico
Safety Grinding Wheel & Machine Co., Box 746, Springfield, Ohio
Safford, Hurd W., Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh 13, Pa.

Salem China Co. (F. W. McKee), Salem, Ohio
Salisbury, Bert E., Onondaga Pottery Co., 1858 W. Fayette St., Syracuse 4, N. Y.
Salisbury, William R., 209 Standish Dr., Syracuse 3, N. Y.
Salsich, Neil E., 296 N. Columbia Ave., Columbus 9, Ohio
Salvador, Odriozola Gomez, Fabrica de Ladrillos Industriales y Refractarios, S. A., Apartado 390, Monterrey, N. L., Mexico
Sammons, Frederick C., General Refractories Co., 3363 Fruitland Rd., Los Angeles 11, Calif.
Sanborn, Paul H., Porcelain Products, Inc., Parkersburg, W. Va.
Sanderson, Maj. W. R., Wright Field, Dayton, Ohio
Sandmeyer, Karl H., 58 Seymour St., Tonawanda, N. Y.
Sanford, Ralph L., Gaston Place, R. D. 2, East Liverpool, Ohio
Santmyers, George S., 812 Washington Dr., Bellevue Branch, Pittsburgh 2, Pa.
†Santomieri, S. Lewis, 701 Kennebec Ave., Takoma Park 12, Md.
Sarraf, Edward M., 20001 Laurel Ave., Rocky River 16, Ohio
Sauereisen, C. Fred, Sauereisen Cements Co., Sharpsburg Sta., Pittsburgh 15, Pa.
Saunders, Alfred C. (Student), 324 E. Chestnut St., East Rochester, N. Y.
Savannah Kaolin Co. (F. H. Opper), 314 American Bldg., Box 184, Savannah, Ga.
Savell, Fred H., 1901 E. Slauson Ave., Los Angeles 11, Calif.
Sawyer, C. Baldwin, Brush Beryllium Co., 3714 Chester Ave., Cleveland 14, Ohio
Saxe, Charles W., 1 Wawecus Rd., Worcester 5, Mass.
Saxonburg Potteries (George H. Aderhold), Saxonburg, Pa.
Saxton, C., Spotswood, Moor Park Rd., Northwood, Middlesex, England
Scammell, Pvt. Robert W. (Student), New York, N. Y.
Schabacker, H. E., Erie Enameling Co., 1400 West 20th St., Erie, Pa.
Schaefer, Carl F., 528 East St., Flint 3, Mich.
Schaefer, W. A., Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago 14, Ill.
Scheier, Edwin, Univ. of New Hampshire, Durham, N. H.
Schell, Donald C. (Student), 404 S. Mathews Ave., Urbana, Ill.
Schiefferle, James A., 2320 Union Ave., Wesleyville, Pa.
Schlegel, Roland F., Caixa Postal 2948, São Paulo, Brazil
Schmid, Arthur W., Investment Bldg., 239 Fourth Ave., Suite 1214, Pittsburgh 22, Pa.
Schmidt, Beuther L., Anchor Hocking Glass Corp., Lancaster, Ohio
Schmidt, Raymond A. (Student), 404 S. Vine St., Urbana, Ill.
Schmunk, Louis, 70 Dunedin Dr., Toronto, Ontario, Canada
Schoeninger, Irvin W., 5250 N. Shoreland Ave., Milwaukee 11, Wis.
Schoenlaub, R. A., Sylvester & Co., Terminal Tower, Cleveland 13, Ohio
†Schoeppel, Norman, 417 E. Jackson St., Mexico, Mo.
*†Schofield, H. Zane, Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio
*Scholes, S. R., N. Y. State College of Ceramics, Alfred, N. Y.
†Scholes, William A., 18930 Littlefield Ave., Detroit 21, Mich.
†Schory, R. M., North Market St., Minerva, Ohio
*Schramm, Edward, Onondaga Pottery Co., Syracuse 4, N. Y.
Schreckengost, Don, 4 Park St., Alfred, N. Y.
Schreiber, Charles L., 163 Walnut St., Corning, N. Y.
*†Schroeder, Fred W., Box 105, Warrenton, Mo.
Schroeder, Herbert S., 621 Vanderbilt Ave., Niagara Falls, N. Y.
Schroter, G. Austin, 1933 N. Edgemont St., Los Angeles, Calif.
Schuh, Arthur E., U. S. Pipe and Foundry Co., Burlington, N. J.
*†Schurecht, H. G., Champion Spark Plug Co., 8525 Butler Ave., Detroit 11, Mich.
*Schurtz, D. D., Sharp-Schurtz Co., Lancaster, Ohio
Schwab, Leon B., 114 E. Union St., Vandalia, Mo.
Schwalbe, F. G., Box 250, Sta. B, Toledo, Ohio
Schwartz, Murray A., 223 Hawthorne Ave., Yonkers, N. Y.
Schwartz, W. D., L. H. Butcher Co., 2030 Bay St., Los Angeles, Calif.
*†Schwartzwalder, Karl, 2150 Rattalee Lake Rd., Holly, Mich.
Schwarz, E. A., Crunden Martin Mfg. Co., 760 South 2nd St., St. Louis 2, Mo.
Schweitzer, Howard V., Schweitzer Equipment Co., 222 Chester-Twelfth Bldg., Cleveland, Ohio
†Schwendler, Richard H., Jackson St., Mentor, Ohio
Schwetye, Fred H., Vandalia, Mo.
Scott, Frances, 1507 Grant Ave., San Francisco, Calif.
†Scott, M. R., Bausch & Lomb Optical Co., Rochester 2, N. Y.
Scott, Roger F., 911 E. Main St., Millville, N. J.
Scott, W. J., 319 N. Washington St., Hinsdale, Ill.
Scripture, C. P., Ingram-Richardson Mfg. Co. of Indiana, Inc., Frankfort, Ind.
Seabright, Edward C., 418 Manistique, Detroit 15, Mich.
Seanor, J. G., 2300 W. Tuscarawas St., Canton 6, Ohio
Searle, A. B., Charlbury, Oxon, England
Searson, Leslie, James Oakes & Co. (Riddings Collieries), Ltd., Jacksdale, Nottinghamshire, England
*Seaton, Max Y., United Chemicals, Inc., 405 Lexington Ave., New York 17, N. Y.
Seaver, Kenneth, Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
Sedenka, Anthony, 105 Christman Ave., Washington, Pa.
Seel, Elsie A., Canandaigua, N. Y.
Seeley, E. L., Neptune Ave., Chester, W. Va.
Segeler, C. G., American Gas Assn., 420 Lexington Ave., New York 17, N. Y.
*†Seil, Gilbert E., Day & Zimmermann, Inc., Packard Bldg., Philadelphia 2, Pa.
Sellers, George A., 1036 S. Harvey Ave., Oak Park, Ill.
†Sellers, John T., 210 N. Pennsylvania Ave., Wellston, Ohio
Seneca Glass Co. (Harry J. Sigwart), Morgantown, W. Va.
Sessler, Matt, 2323 West 3rd St., Cleveland 13, Ohio
†Shaffer, Paul C., 126 Crawford Ave., Altoona, Pa.
Shand, Errol B., 168 Pine St., Corning, N. Y.
Shank, Jacob R., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Shank, John J., Wayne Labs., 17 E. Main St., Waynesboro, Pa.
Shanks, Douglas, Victorian Pottery, Barrhead, near Glasgow, Scotland
Shanok, Victor, 407 Douglass St., Brooklyn, N. Y.
Shardlow, L. Russel, RCA Victor Div., Radio Corp. of America, Harrison, N. J.
*Sharp, Donald E., Libbey-Owens-Ford Glass Co., 1701 E. Broadway, Toledo, Ohio
†Sharp, Everett W., 827 N. Calhoun, Mexico, Mo.
Shaver, W. W., 214 Wall St., Corning, N. Y.
Shaw, Douglas M., 301 N. Bridge St., San Gabriel, Calif.
*Shaw, J. B., 5402 13th St., N. W., Washington 11, D. C.
Shaw, L. I., 7420, Western Electric Co., Hawthorne Sta., Chicago 23, Ill.
*†Shaw, M. C., 289 Seaman St., New Brunswick, N. J.
Shaw, Ronald H., L. E. Shaw, Ltd., Halifax, Nova Scotia
Shearer, Walter L., 45 Ridge Ave., Morrisville, Pa.
*Sheerer, Mary G., 2508 Auburn Ave., Cincinnati 19, Ohio
Sheldon, John L., 112 E. Third St., Corning, N. Y.
Sheldon, Robert E., 3039 Wallace Ave., Bronx 67, N. Y.
Shelley, Cranson B., General Refractories Co., Box 1673, Baltimore 3, Md.

*Shelton, G. R., 6614 Delfield St., Chevy Chase, Md.
Shenango Pottery Co. (James M. Smith), New Castle, Pa.
Shepard, Anna O., 751 11th St., Boulder, Colo.
Shepherd, John F., Shepherd Chemical Co., Norwood, Cincinnati 12, Ohio
Sherwin, Ronald W., H. R. Johnson, Ltd., Tunstall, Staffordshire, England
*†Sherwood, Robert F., United Feldspar & Minerals Corp., 10 East 40th St., New York 16, N. Y.
Shevlin, Lt. Thomas S. (Student), 227 E. Northwood Ave., Columbus 1, Ohio
Shimer, J. B., 16 Grant St., Wellsboro, Pa.
Shimman, Norman C., 19175 Pierson St., Detroit 19, Mich.
Shipley, R. A., National Fireproofing Corp., 202 E. Ohio St., Pittsburgh 12, Pa.
*Shively, R. R., Chartiers St., Washington, Pa.
Shoemaker, George, Arketex Ceramic Corp., Brazil, Ind.
Shoemaker, J. H., Kolene Corp., 315 Boulevard Bldg., Detroit 2, Mich.
†Shonkwiler, Francis P., 4211 W. Hill Ave., N. D. G., Montreal 28, Quebec, Canada
Shook, Thurston W., 845 Hanna Bldg., Cleveland, Ohio
Short, Albert P., Charles Taylor Sons Co., 401 N. Broad St., Philadelphia 8, Pa.
Short, Allan M., 1710 Missouri Pacific Bldg., St. Louis 3, Mo.
Shorter, A. J., Bonnybridge Silica & Fireclay Co., Ltd., Bonnybridge, Stirlingshire, Scotland
Shroder, Theresa, 6681 Fountain Ave., Hollywood 28, Calif.
†Shukle, Archie A., 3503 Flushing Rd., Flint 7, Mich.
Shuman, Albert, 41 East 42nd St., New York 17, N. Y.
Shute, Robert L., 125 N. Twenty-first St., Newark, Ohio
Siefert, August C., Owens-Corning Fiberglas Corp., Newark, Ohio
Siegwald, Clyde R., Upland Ave., Arbutus Park, Park, W. Va.
Sierra Talc Co. (E. J. Ellsworth), 724 S. Spring St., Rm. 1320, Los Angeles 14, Calif.
Sievert, Guilio E., 8169 San Antonio, South Gate, Calif.
Sigwart, Harry J., Seneca Glass Co., Morgantown, W. Va.
Silk, Karl, Jury Holloware, Ltd., Sandy Rd., Norton, Stourbridge, England
*†Silverman, Alexander, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh 13, Pa.
Silverman, William B., Owens-Illinois Glass Co., 1700 Westwood Ave., Toledo 1, Ohio
†Simison, A. L., Owens-Corning Fiberglas Corp., Newark, Ohio
Simmons, Robert M., 3269 Casitas Ave., Los Angeles 26, Calif.
Simon, A. G., 3014 Piedmont Ave., La Crescenta, Calif.
Simonds Worden White Co. (F. R. Henry), North Summit St. and Negley Place, Dayton 7, Ohio
Simonsen, Eduardo C., Companhia Paulista de Mineração, Caixa Postal 3008, São Paulo, Brazil
Simonsen, Victor G., Ceramica São Caetano, S. A., Caixa Postal 278, São Paulo, Brazil
Simpson, Ernest, Highview Fenton Manor, Stoke-on-Trent, Staffordshire, England
†Simpson, Harold E., Mellon Inst., Pittsburgh 13, Pa.
Simpson, Thomas, Simpson's (Potters), Ltd., Elder Works, Stoke-on-Trent, England
Simpson, Thomas P., Socony-Vacuum Oil Co., Inc., Research & Development Labs., Paulsboro, N. J.
Simson, Curt J., 425 Central Park, W., New York 25, N. Y.
*Singer, Felix, Keramos House, 46, Castlemaine Ave., South Croydon, Surrey, England
Sirovy, George, Century Vitreous Enamel Co., 6641 S. Narragansett Ave., Chicago 38, Ill.
Sixt, Lawrence F., 438 E. Winter Ave., New Castle, Pa.
Sjöström, Ivar, Höganäs-Billesholms Aktiebolag Höganäs, Sweden
Skeoch, Walter K., 320 S. Mission Rd., Los Angeles 33, Calif.
†Skinner, Kenneth G., 3207 Franklin Ave., Seattle 2, Wash.
Skoog, Harold O., American Emery Wheel Works, 1 Richmond Sq., Providence 1, R. I.
Slayter, Games, Owens-Corning Fiberglas Corp., Newark, Ohio
Slick, E. E., Sr., Haws Refractories Co., 2128 Farmers Bank Bldg., Pittsburgh 22, Pa.
†Slyh, John A., National Carbon Co., Fostoria, Ohio
Smith, A. O., Corp. (W. W. Higgins), 3533 North 27th St., Milwaukee, Wis.
Smith, Lt. Bernard C., Albany, Ga.
Smith, C. A., Mexico Refractories Co., Mexico, Mo.
†Smith, Charles A., 326 Woodlawn, Mexico, Mo.
Smith, Donald I., Denver Fire Clay Co., Denver 2, Colo.
Smith, Donald R., ML3/c, San Francisco, Calif.
Smith, Earl R. (Student), 1406 N. Jefferson, Johnston City, Ill.
Smith, Frank A., R. D. 1, Box 595, Lafayette, Calif.
Smith, F. E., Harris Clay Co., Spruce Pine, N. C.
Smith, F. Goodwin, Hartford-Empire Co., Box 1620, Hartford, Conn.
Smith, G. Frederick, Chemistry Dept., Univ. of Illinois, Urbana, Ill.
Smith, Gail P., Box 158 A, R. D. 1, Corning, N. Y.
†Smith, Hillard A., 59 Walnut Place, Metuchen, N. J.
Smith, H. P., Joseph Dixon Crucible Co., Jersey City 3, N. J.
Smith, James M., Shenango Pottery Co., New Castle, Pa.
Smith, James N., Jr., 142 Pollock St., New Bern, N. C.
Smith, J. Ernest, 1351 Marlborough Ave., Plainfield, N. J.
Smith, J. R., Kentuckiana Potteries, Inc., Third and Ohio Sts., Paducah, Ky.
Smith, Karl W. S., Charles Taylor Sons Co., Cincinnati 14, Ohio
*†Smith, Kenneth E., Escuela Nacional de Bellas Artes, Tegucigalpa, Honduras, Central America
Smith, Leland, Acme Brick Co., Box 708, Denton, Texas
Smith, Louis A., Jones & Laughlin Steel Corp., Aliquippa, Pa.
Smith, Paul L., Sound Div., Naval Research Lab., Washington 20, D. C.
Smith, Ralph O., 30 Chestnut St., Salem, N. J.
Smith, R. K., 149 Reynolds Ave., Corning, N. Y.
Smith, Rowland D., 12 Woodlawn Ave., Corning, N. Y.
Smith, Russell C., R. D. 4, Lincoln Trail, East St. Louis, Ill.
Smith & Stone, Ltd. (W. B. Ford), Georgetown, Ontario, Canada
Smith, Walter T., 30 Austin St., New Haven 15, Conn.
Smith, Wendell O., Corning Glass Works, Corning, N. Y.
Smith, Wilbur R., 2126 Kennedy St., Philadelphia 24, Pa.
Smock, Alden W., 103 E. Underwood St., Chevy Chase 15, Md.
Smoke, Edward J., 199 Amboy Ave., Metuchen, N. J.
Smoot, Jack M., R. D. 1, Rivoli, Macon, Ga.
Smothers, William J. (Student), Rostone Corp., Lafayette, Ind.
Smyth, Harold T., Corhart Refractories Co., Louisville 10, Ky.
Snead, Jane, Ceramic Studio (Thomas S. Snead), 1822 Chestnut St., Philadelphia 3, Pa.
Snead, Jane, 1822 Chestnut St., Philadelphia 3, Pa.
Snead, Thomas S., Jane Snead Ceramic Studio, 1822 Chestnut St., Philadelphia 3, Pa.
Snelsire, W. P., Pennsylvania Salt Mfg. Co., 541 Union Trust Bldg., Pittsburgh 19, Pa.
Snow, Roland B., Research Lab., U. S. Steel Corp., Kearny, N. J.
†Snyder, Ernest B., Apt. 15, 716 6th Ave., Bethlehem, Pa.
Snyder, Nicholas H., National Ceramic Co., 400 Southard St., Trenton 2, N. J.
Snyder, Ray A., Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
Snyder, R. B., Bell & Howell Co., 7100 McCormick Rd., Chicago 45, Ill.

Society of Glass Technology, W. E. S. Turner, "Elmfield," Northumberland Rd., Sheffield 10, England
*Sohn, Erwin, American Radiator & Standard Sanitary Corp., 1541 South 7th St., Louisville 8, Ky.
*†Solèr, Gilbert, Steel & Tube Div., Timken Roller Bearing Co., Canton 6, Ohio
†Solomon, Earl A., 32 Sickmon St., Hamburg, N. Y.
Solvay Process Co. (L. W. Peterson), Syracuse 1, N. Y.
*Somers, A. J., Borax Consolidated, Ltd., Danes Hill, Oxshott, Surrey, England
Somerville, Thomas, III, Washington Brick Co., Muirkirk, Md.
†Sommerville, J. L., Winburne, Pa.
Sondles, Merrill C., Paden City Pottery Co., Paden City, W. Va.
Sorensen, Victor, 700 E. Maple St., Glendale 5, Calif.
Sorkin, Jacob, 1181 Randall Ave., Bronx 59, N. Y.
*†Sosman, Robert B., U. S. Steel Corp., Research Lab., Lincoln Highway, Kearny, N. J.
South, Furman, Jr., Lava Crucible Co. of Pittsburgh, 627 Wabash Bldg., Pittsburgh 22, Pa.
Sovereign Potters, Ltd. (W. G. Pulkingham), Hamilton, Ontario, Canada
Sparks, Edgar W., 406 Unaka Way, Erwin, Tenn.
Sparks, James C., 2212 Carter Ave., Nashville, Tenn.
Sparler, D. J., Universal Asbestos Corp., 87–41 130th St., Richmond Hill, N. Y.
Sparrow, Paul F., 610 Shady Dr., E., Pittsburgh 16, Pa.
Speer Resistor Corp. (G. G. Herrick), Box 111, St. Marys, Pa.
Speil, Sidney, U. S. Bureau of Mines, Norris, Tenn.
Spence, C. F., 343 Wood St., Mansfield, Ohio
Spence, Harold I., Klabin Irmaos & Cia, Avenida Suburbana 5472, Meier, Rio de Janeiro, Brazil
Spence, Hugh S., Industrial Minerals Div., Bureau of Mines, Ottawa, Ontario, Canada
*Spencer, Charles D., General Electric Co., 1133 East 152nd St., Cleveland 12, Ohio
Spencer, Ernest H., Friendship, N. Y.
*†Spencer-Strong, G. H., 4134 Westview Rd., Baltimore 18, Md.
Spengler, H. H., Mahoning Glass Works, Niles, Ohio
Spikes, W. F., Dept. 817, Sears Roebuck & Co., 925 S. Homan Ave., Chicago 7, Ill.
Spinks, H. C., Clay Co. (R. B. Carothers), Box 256, Newport, Ky.
†Spires, Stephen T., North American Refractories Co., Mount Union, Pa.
Spring, F. W., Metters, Ltd., Mitchell Rd., Alexandria Sidney, N. S. W., Australia
*†Sproat, Ira E., 58 Washington St., Westport, Conn.
Spurck, Richard F., 1180 Regent St., Schenectady 8, N. Y.
Square D Co. (H. S. Freeman), 6060 Rivard St., Detroit 11, Mich.
Stafficker, Charles F., 8th St. and Park Ave., Vineland, N. J.
Stafford, Edward F., Patterson Heights, Beaver Falls, Pa.
†Stafford, W. L., Johns-Manville Research Labs., Manville, N. J.
Stahl, C. B., White Hall Sewer Pipe & Stoneware Co., White Hall, Ill.
Stalego, Charles J., 247 N. Fifth St., Newark, Ohio
Staley, Dean M., 2304 N. Mercer St., New Castle, Pa.
Standard Brick & Tile Corp. (H. C. Kleymeyer), Evansville 19, Ind.
Standard Ultramarine Co. (L. F. May), Huntington 18, W. Va.
Stangl, J. M., Fulper Pottery Co., Flemington, N. J.
Stanko, J. A., 5601 S. Boyle Ave., Los Angeles, Calif.
Stanworth, John E., 24, Ringinglow Rd., Ecclesall, Sheffield, England
Star Porcelain Co. (R. W. Ferguson), Muirhead Ave., Trenton 9, N. J.
Stark Brick Co. (J. H. Stewart), Box 230, Canton, Ohio
Stark, Rawson E., R. D. 5, Greensburg, Pa.
Starkey, Daryle D., 1975 Sixth St., S. W., Akron 14, Ohio
Staudt, August, 264 Water St., Perth Amboy, N. J.
Stauffer Chemical Co., 420 Lexington Ave., New York 17, N. Y.
Stauffer, S. Walter, National Lime Assn., 927 Fifteenth St., N. W., Washington 5, D. C.
Steck, C. O., 1 Twenty-eighth St., Pittsburgh, Pa.
Steele, G. Allen, 546 Cedarhurst Ave., Dayton 7, Ohio
Steele, H. D., Shorter & Son, Ltd., Copeland St., Stoke-on-Trent, England
Steil, Roy C., 1228 Prairie Ave., Des Plaines, Ill.
Stein, Colonel Alan, Millfield, Polmont, Stirling, Scotland
Stein, Beryl (Student), 65 Clarmont Rd., Bernardsville, N. J.
Stein, Colin H., 39 Snowdon Place, Stirling, Scotland
Stein, Norman A., Rossmor, Grantown-on-Spey, Scotland
Steinbock, E. A., Whip-Mix Corp., 411 W. Avery St., Louisville 8, Ky.
Steinbrunn, Herman F., 1348 College Ave., Palo Alto, Calif.
Steiner, Harry C., 518 Sanders Ave., Scotia 2, N. Y.
*†Steinhoff, Fred L., Rm. 1410, 59 E. Van Buren St., Chicago 5, Ill.
*Stephani, William J., O. W. Ketcham Terra Cotta Works, Crum Lynne, Pa.
Stephenson, S. R., Box 1192, Birmingham, Ala.
Sterling China Co. (W. T. Pomeroy), East Liverpool, Ohio
Sterling Grinding Wheel Div., Cleveland Quarries Co. (A. E. Tulk), Tiffin, Ohio
Stettinius, K. E., Lapp Insulator Co., Inc., Le Roy, N. Y.
Steubenville Pottery Co. (W. J. Mould), Steubenville, Ohio
Stevens, Lt. Donald K. (Student), New York, N. Y.
*Stevens, Douglas F., 1210 W. California Ave., Urbana, Ill.
†Stevens, Frank J., 198 S. Crest Rd., Chattanooga 4, Tenn.
†Stevens, Robert P., Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago 4, Ill.
†Stevenson, James K., Jr., R. D. 2, Mundelein, Ill.
Stevenson, Samuel, 1967 Grafton Rd., Elyria, Ohio
Steventon, Horace, John Steventon & Sons, Ltd., Cledford Works, Middlewich, Cheshire, England
Stewart, Alexander, National Lead Co., 105 York St., Brooklyn 1, N. Y.
Stewart, John A., c/o S. E. Stewart, 605 S. Sixth St., Vandalia, Ill.
Stewart, J. G., Braun Corp., 2260 East 15th St., Los Angeles 21, Calif.
Stewart, J. H., Stark Brick Co., Box 230, Canton, Ohio
Stewart, Malcolm, 310 Irwin St., San Francisco 7, Calif.
Stewart, S. T., 1205 Carlisle St., Tarentum, Pa.
Stickley, E., Pittsburgh Plate Glass Co., Creighton, Pa.
†Stief, W. C., 158 S. Wilson Blvd., Mount Clemens, Mich.
Stockbridge, Charles, 559 Connecticut St., Gary, Ind.
Stockslager, Theodore F., 24838 W. Lake Rd., Bay Village, Ohio
Stockstrom, Arthur, American Stove Co., St. Louis, Mo.
Stockton, Marion B., 909 Gaffey Place, San Pedro, Calif.
Stoffer, Ross, American Clay Forming Co., Tiffin, Ohio
Stohl, L. A., Wisconsin Porcelain Co., Sun Prairie, Wis.
†Stolte, Norman H., 3974 Orchard Rd., Cleveland Heights 21, Ohio
Stone, C. P., Ferramic Industries, Ltd., Hydeway, Welwyn Garden City, Hertfordshire, England
Stone, Robert J., John W. Higman Co., 24 State St., New York 4, N. Y.
†Stone, Robert L., Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
Stong, Guy E., Strathmont Park, Elmira, N. Y.
Stookey, Stanley D., 145 Pritchard Ave., Corning, N. Y.
Stott, A. E., Edward Johns & Co., Ltd., Armitage, near Rugeley, Staffordshire, England
*†Stout, Wilber, 154 Erie Rd., Columbus 2, Ohio
Stratton, Mrs. W. B., Pewabic Pottery, 10125 Jefferson Ave., Detroit 14, Mich.
Streator Brick Co. (D. P. Ogden), Streator, Ill.

Strikow, M. H., 5064 W. Adams Blvd., Los Angeles 16, Calif.
Stringer, Fred W., 3765 Dover Place, Los Angeles 26, Calif.
Strod, Arved J., Vitro Mfg. Co., Corliss Sta., Pittsburgh, Pa.
Strong Manufacturing Co. (W. U. Pfaeffli), Sebring, Ohio
Strong, John, 46 Center Ave., Belmont, Boston, Mass.
Stroud, Harold L., 3426 Hunter Ave., Royal Oak, Mich.
Stroup, Philip T., Aluminum Co. of America, Box 772, New Kensington, Pa.
Structural Clay Products Inst. (Harry C. Plummer), 1756 K St., N. W., Washington 6, D. C.
Struebing, Harold J., 344 Stillwell Ave., Kenmore 17, N. Y.
Stubbins, W. J., Puerto Rico Clay Products Corp., Box 4083, San Juan 20, Puerto Rico
Stuckey, David L., Box 1052, Macon, Ga.
Stuckey, Jasper L., Univ. of North Carolina, Raleigh Unit, Raleigh, N. C.
Stufft, Paul C., 2802 Inglewood Ave., Baltimore, Md.
Stupakoff Ceramic & Mfg. Co. (Semon H. Stupakoff), Latrobe, Pa.
Stupakoff, Semon H., Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
Sturgeon, Walter L., Corrientes 378, Buenos Aires, Argentina
Styer, Charles A., 11 Roxbury Rd., Forest Hills, Pittsburgh 21, Pa.
Sugden, John A., "Sharrow," Dunley Rd., Stourport, Worcestershire, England
*Sullivan, Eugene C., Corning Glass Works, Corning, N. Y.
*Sullivan, John D., Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio
Summerhays, Louis J., William Summerhays Sons Corp., 620 Clinton Ave., S., Rochester 7, N. Y.
Summers, E. W., Owens-Illinois Glass Co., General Engr. Dept., Alton, Ill.
Summitville Face Brick Co. (H. K. Lynn), Summitville, Ohio
Sumrell, Ferrall N., 223 Henry St., East Hempstead, N. Y.
Sun, Kuan-Han, Research Labs., Eastman Kodak Co., Rochester 4, N. Y.
Sur Enamel & Stamping Works, Ltd. (M. M. Sur), 9 Middle Rd. Entally, Calcutta, India
Sur, M. M., Sur Enamel & Stamping Works, Ltd., 9 Middle Rd. Entally, Calcutta, India
Surface Combustion Corp. (Harvey C. Weller), 2375 Dorr St., Toledo 1, Ohio
Surfleet, Harold, Kaylene Labs., Waterloo Rd., London, N. W. 2, England
Sutherland, J. Clark, Pacific Clay Products, 306 West Ave. 26, Los Angeles 31, Calif.
Sutphen, F. G., American Rolling Mill Co., Middletown, Ohio
Sutterlin, Frederick, Scammell China Co., Trenton 10, N. J.
Sutton, W. J., Alfred, N. Y.
Svec, J. J., 3440 S. Euclid Ave., Berwyn, Ill.
*†Swain, Stephen M., 3403 Spangler Rd., Cleveland Heights 12, Ohio
Swalm, Phaon H., Box 178, Kingston, Ontario, Canada
Swan, S. D., Dentists' Supply Co., 220 West 42nd St., New York 18, N. Y.
Swearingen, J. C., Hazel-Atlas Glass Co., Zanesville, Ohio
*†Sweely, B. T., Chicago Vitreous Enamel Product Co., 1407 South 55th Court, Cicero 50, Ill.
Sweitzer, Mark, Texas Pottery Works, 10322 Wiggins, Houston 15, Texas
Swenson, George W., Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.
Swentzel, John P., 2725 Weston Ave., Niagara Falls, N. Y.
*Sweo, Benjamin J., 17502 Riverway Dr., Lakewood 7, Ohio
Swerdlow, Max, National Bureau of Standards, Rm. 251, Washington 25, D. C.
Swicker, Victor C., Hartford-Empire Co., Hartford, Conn.
Swift, Howard R. (Student), Libbey-Owens-Ford Glass Co., 1701 E. Broadway, Toledo 5, Ohio
Swindell Brothers, Bayard and Russell Sts., Baltimore, Md.
Swindell-Dressler Corp. (Philip Dressler), Box 1888, Pittsburgh 30, Pa.
Swinnerton, Bertram B., 21 Second Ave., Tiffin, Ohio
Swinnerton, George R., 529 Vincent Blvd., Alliance, Ohio
Swinney, Lawrence A., 180 E. Lakeview, Columbus, Ohio
†Sylvester, George R., Sylvester & Co., 1614 Terminal Tower, Cleveland 13, Ohio
Syndicat des Fabricants de Produits Céramiques, Jean Berard, 84 Rue d'Hauteville, Paris, France

Taber, A. W., Charles Engelhard, Inc., 90 Chestnut St., Newark, N. J.
Taft, Kathleen I., 22 Maple St., Addison, N. Y.
Tait, Leonard G., Cia. Geral de Engenharia para America do Sul, Predio Conde Matarazzo, Rua Dr. Falcao Filho 56, São Paulo, Brazil
Tama, Manuel, Ajax Engr. Corp., Box 1418, Trenton 7, N. J.
Tancous, Ernest, c/o Otto Koutesky, 7804 Drexel Ave., Chicago, Ill.
Tarnopol, Milton S., 943 Ninth Ave., Brackenridge, Pa.
†Tate, Frank E., 686 W. Ohio Ave., Sebring, Ohio
†Tauber, Charles B., 2301 Broadway, Catlettsburg, Ky.
†Tauber, John A., 1424 Powell St., Norristown, Pa.
Taylor, A. H., Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago 4, Ill.
Taylor, Charles, Sons Co. (C. R. Taylor), Box 58, Annex Sta., Cincinnati 14, Ohio
Taylor, Charles H., Jr. (Student), 19 Linwood Terrace, Buffalo 9, N. Y.
Taylor, C. R., Charles Taylor Sons Co., Box 58, Annex Sta., Cincinnati 14, Ohio
Taylor, John B. (Student), 1896 N. High St., Columbus, Ohio
*Taylor, Nelson W., Research Dept., Minnesota Mining & Mfg. Co., St. Paul 6, Minn.
Taylor, R. F., Pilkington Brothers, Ltd., St. Helens, Lancashire, England
Taylor, Smith & Taylor Co. (W. E. Palmer), Chester, W. Va.
*Taylor, W. C., Corning Glass Works, Corning, N. Y.
*Teetor, Paul, 253 Altamont Place, Somerville, N. J.
*†Tefft, C. Forrest, Claycraft Co., Box 866, Columbus 16, Ohio
Tefft, Philip W., 1381 West 6th Ave., Columbus 8, Ohio
Tencza, Andrew (Student), 224 N. Elm St., Wallingford, Conn.
Tepping, Herbert, 334 Kenwood Ave., Dayton 5, Ohio
Terman, Mark J., Babcock & Wilcox Co., 2730 Koppers Bldg., Pittsburgh 19, Pa.
Terrill, Gerald, McKee Glass Co., Jeannette, Pa.
Terry, Griffin E., Edison General Electric Appliance Co., Inc., 5600 W. Taylor St., Chicago 44, Ill.
Terry, John H., Jr., Farrhill, Westmoreland Depot, N. H.
Tesi, A. Frank, 315 Craig St., Pittsburgh, Pa.
*Tetrick, James D., 542 Coleman Place, Westfield 19, N. J.
Texas Mining & Smelting Co. (W. J. Graveling), Box 559, Laredo, Texas
Thatcher Mfg. Co. (Roy S. Arrandale), 1901 Grand Central Ave., Elmira, N. Y.
Theobald, Erwin F., 1516 18th St., N. W., Canton 3, Ohio
Thermo Fire Brick Co. (Howard Hicks), Box 277, Sulphur Springs, Texas
*†Thiemecke, Harry W., Homer Laughlin China Co., Newell, W. Va.
*Thiess, L. E., Porcelain Mfg. Div., General Electric Co., Schenectady 2, N. Y.

Thomas, C. W., E. J. & J. Pearson, Ltd., Firebrick Works, Stourbridge, England
Thomas, Major Charles W. (Honorary), Clifton House, Old Swinford, Stourbridge, England
†Thomas, Everett A., 28 Montclair St., Buffalo 15, N. Y.
Thomas, Henry H., c/o Mrs. Helen McCabe, York Rd., R. D. 8, Towson, Baltimore 4, Md.
†Thomas, James A., 2894 McKoon Ave., Niagara Falls, N. Y.
Thomas, Lawrence E., Country Club Estates, Kittanning, Pa.
Thompson, A. Paul, Mellon Inst., Pittsburgh 13, Pa.
*Thompson, Clyde L., 4922 New Plymouth Rd., Pittsburgh 10, Pa.
Thompson, D. A., Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Thompson, Franklin S., 25 Schenck Ave., Matawan, N. J.
Thompson, Fred S., Corhart Refractories Co., Inc., 16th and Lee Sts., Louisville 10, Ky.
Thompson, M. W., Hall China Co., East Liverpool, Ohio
Thompson, Noel M., 721 Shady Lane, Pittsburgh 16, Pa.
Thompson, Paul G. (Student), 33 E. Oakland Ave., Columbus, Ohio
Thompson, Thomas C., 1419 Central Ave., Wilmette, Ill.
Thomson, Homer G., 211 North 88th St., Wauwatosa 13, Wis.
Thor, Murner E., 508 S. Serrano Ave., Los Angeles 5, Calif.
Thorley, Joseph P., Parkway, East Liverpool, Ohio
Thorn, William J., Innis, Speiden & Co., 401 N. Broad St., Philadelphia, Pa.
Thorngate, Bruce W., Box 2614, Univ. Sta., Gainesville, Fla.
Thornton, Joseph W., 540 Lee St., Des Plaines, Ill.
†Thornton, Paul E., 900 N. Howard St., Glendale 7, Calif.
Thorson, Marion S., 6249 S. Kenwood, Apt. 310A, Chicago, Ill.
Thropp, Herreld D., Eureka Flint & Spar Co., Box 266, Trenton 2, N. J.
Thuener, Everett E., 412 Reynolds St., Scotia, N. Y.
Thurn, Haldon L., 709 E. Juneau Ave., Milwaukee 2, Wis.
*†Thurnauer, Hans, 1811 Hixson Pike, Chattanooga 5, Tenn.
Thwing, C. B., 45 W. Tulpehocken St., Philadelphia 44, Pa.
Tiebout, C. H., Gleason-Tiebout Glass Co., 59 54th St., Maspeth, N. Y.
Tiede, Ralph L., 268 Elmwood Ave., Newark, Ohio
Tillotson, Clifford, Tillotson Refractories Co., 1112 West 6th St., Corona, Calif.
*Tillotson, E. Ward, Mellon Inst., Pittsburgh 13, Pa.
Tillyer, E. D., American Optical Co., Southbridge, Mass.
Tims, John W., 63 Moull St., Newark, Ohio
Tinsley, Stanley G., British Titan Products Co., Ltd., Billingham, Durham, England
Tipping, J., United Glass Bottle Mfgrs., Ltd., 8, Leicester St., London, W. C. 2, England
Titanium Alloy Mfg. Co. (Librarian), Drawer D, Niagara Falls, N. Y.
Titus, Henry B., North American Refractories Co., 50 Church St., New York 7, N. Y.
Tobitt, F. A., American Rolling Mill Co., Middletown, Ohio
Todd, Edwin R., 2143 Norton Rd., Charlotte, N. C.
Todd, Henry, Biggar, Saskatchewan, Canada
Tool, Arthur Q., National Bureau of Standards, Washington, D. C.
Tooley, F. V., Owens-Corning Fiberglas Corp., Newark, Ohio
Topping, John, 434 Carnegie Bldg., Pittsburgh, Pa.
Torno, Ralph F., 369 Front St., 1, Berea, Ohio
Torok, Julius J., 134 E. Fourth St., Corning, N. Y.
Toulouse, Julian H., 1817 Potomac Dr., Toledo 7, Ohio
†Trabert, Loren A., Pickard, Inc., Antioch, Ill.
*†Treischel, C. C., R. T. Vanderbilt Co., 230 Park Ave., New York 17, N. Y.
Trenton Potteries Co. (Leonard H. Hepner), Plant 5, Box 141, Trenton 1, N. J.
Trevathan, P. Edward, Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Trevor, John F., Moira Rd., Woodville, near Burton-on-Trent, England
Trine, Robert, 1685 Blake Ave., Los Angeles 31, Calif.
Trivedi, Krishnaprasad P., Bombay Potteries & T., Ltd., Bombay, India
Trost, Conrad, Mellon Inst., Pittsburgh 13, Pa.
*†Trostel, L. J., General Refractories Co., Box 1673, Baltimore 3, Md.
Trott, R. P., General Abrasive Co., Inc., Niagara Falls, N. Y.
Trowbridge, P. S., Hydraulic Press Brick Co., 1337 S. Kingshighway, St. Louis 10, Mo.
Troy, Walter J., 888 Chili Ave., Rochester, N. Y.
Truby, Harry A., 604 Ridge Ave., New Kensington, Pa.
Tryon, William P., 1971 East 119th St., Cleveland 6, Ohio
Tucker, Edward F., Stebbins Engr. & Mfg. Co., Watertown, N. Y.
†Tucker, Harvey C., Allied Engr. Co., 4150 East 56th St., Cleveland, Ohio
Tulk, A. E., Sterling Grinding Wheel Div., Cleveland Quarries Co., Tiffin, Ohio
Turbett, Forrest L., Eagle-Picher Co., Research Lab., Joplin, Mo.
*Turk, Karl, Pemco Corp., 5601 Eastern Ave., Baltimore 24, Md.
*†Turk, Richard H., Pemco Corp., 5601 Eastern Ave., Baltimore 24, Md.
Turnbull, Edward D., 500 Penn Ave., Scranton 3, Pa.
Turnbull, John C., 19 Moran Ave., Princeton, N. J.
Turnbull, John E., 1101 Kemp Ave., Ironton, Ohio
Turnbull, Lt. Robert C. (Student), 22 Third St., Canisteo, N. Y.
Turner, A. A., 153 Lake Ave., Metuchen, N. J.
Turner, Cecil H., 2552 East 96th St., Chicago 17, Ill.
Turner, Donald, Messrs. Lodge Plugs, Ltd., Rugby, England
Turner, Maj. P. P., Jr. (Student), 706 Fifth Ave., Greensboro, N. C.
Turner, W. A., McLain Fire Brick Co., 1239 Gulf Bldg., Pittsburgh 19, Pa.
Turner, W. E. S. (Honorary), "Elmfield," Northumberland Rd., Sheffield 10, England
Tuttle, Milton (Student), Almond, N. Y.
*†Twells, Robert, Electric Auto-Lite Co., Spark Plug Div., Box 231, Fostoria, Ohio
Twining, F. E., Twining Labs., Box 1472, Fresno 16, Calif.
Twyfords, Ltd., Cliffe Vale Potteries, Stoke-on-Trent, England
Tygart Valley Glass Co. (O. C. Noble), Washington, Pa.
Tyler, W. S., Co. (C. E. Jenks), 3615 Superior Ave., N. E.-Cleveland 14, Ohio
Tyrrell, Miles E., 935 Main St., Wayne, Neb.

Ueltz, H. F. G. (Student), 56 Franklin Place, Morris Plains, N. J.
Uhrmann, Carl J., Box 13, Bellaire, Ohio
Ulmer, Carl D., Koppers Co., Inc., Research Div., 945 Koppers Bldg., Pittsburgh 19, Pa.
Ulrich, Robert J., American Radiator & Standard Sanitary Corp., Litchfield Plant, Litchfield, Ill.
Underwood, R. R., Knox Glass Associates, Inc., Knox, Pa.
Union Electrical Porcelain Works, Inc. (F. W. Van Orden), Box 762, Trenton 5, N. J.
United Clay Mines Corp. (K. E. Ward), Oakland and Prospect Sts., Trenton 6, N. J.
United Glass Bottle Mfgrs., Ltd. (J. Tipping), 8, Leicester St., London, W. C. 2, England
United States Glass Co. (C. W. Carlson), Tiffin, Ohio
United States Gypsum Co. (J. S. Offutt), 300 W. Adams St., Chicago 6, Ill.
Universal Clay Products Co. (C. A. Bloor), Sandusky, Ohio

Universal Dental Co. (Joseph Kohn), 48th and Brown Sts., Philadelphia 39, Pa.
Universal Potteries, Inc. (G. D. Agnew), Cambridge, Ohio
Universal Sanitary Mfg. Co. (W. Keith McAfee), New Castle, Pa.
Upham, Bernard G., Box 233, Lawyers Rd., Vienna, Va.
Upton, Lee O., 2544 East 97th Place, Chicago 17, Ill.
Utter, Joseph L., 1888 Bay Rd., R. D., North Easton, Mass.

*Vail, James G., 502 W. Front St., Media, Pa.
Valentine, M. D., & Brother Co. (W. H. Peterson), Woodbridge, N. J.
Valentine, Peter C., 620 Market St., San Francisco 4, Calif.
†Vance, Edward D., Bay State Abrasive Products of Canada, Ltd., Brantford, Ontario, Canada
Van Cleave, A. A., 650 S. Highland Ave., Los Angeles 36, Calif.
Vanderbilt, R. T., Co. (Ira E. Sproat), 230 Park Ave., New York 17, N. Y.
Vanderpool, James W., 21 Spruce St., Dedham, Mass.
Vandolah, Harry J., 1015 Division St., Oak Park, Ill.
Van Houten, Robert M., Kokomo Sanitary Pottery Corp., Kokomo, Ind.
Vanick, James S., International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.
Van Orden, F. W., Union Electrical Porcelain Works, Inc., Box 762, Trenton 5, N. J.
Van Peursem, Ralph L., 49 Colonial Village Rd., Rochester 10, N. Y.
*Van Schoick, Emily C., 60 E. Norwich Ave., Columbus 1, Ohio
Van Vlack, L. H., 405 Ash Ave., Ames, Iowa
Van Zee, Arthur F., 3430 Inverness Ave., Toledo 7, Ohio
†Vaughan, T. Carter, 2736 Powhatan Parkway, Toledo, Ohio
*†Vaughan, W. Harry, 2420 Alston Dr., S. E., Atlanta, Ga.
Venable, Charles R., 933 Watauga St., Kingsport, Tenn.
Verebes, Erno, Hedi Schoop Art Creations, Box 384, North Hollywood, Calif.
Vereeniging Brick & Tile Co., Ltd. (L. Wishart), Box 49, Vereeniging, Transvaal, South Africa
Veri, Geno G., 816 Morton St., New Castle, Pa.
Vesuvius Crucible Co. (Francis L. Arensberg), Box 8275, Swissvale, Pittsburgh 18, Pa.
Vickers, Arthur E. J., Hazeldene, Junction Rd., Norton-on-Tees, Durham, England
Victor Insulators, Inc. (H. Failmezger), Victor, N. Y.
Vielhaber, Louis, Lippestr 11, Duisburg, Germany
Viking Glass Co. (G. R. Cummings), New Martinsville, W. Va.
Vilican, Lt. George, Jr., New York, N. Y.
†Vincent, George L., 159 Oaklyn Terrace, Trenton, N. J.
Vitrefrax Corp. (R. W. Ellison), 5050 Pacific Blvd., Los Angeles 11, Calif.
Vitreous Steel Products Co. (Edgar H. Weil), Newburg Sta., Cleveland 5, Ohio
Vitro Mfg. Co. (E. M. Fleck), Corliss Sta., Pittsburgh 4, Pa.
Vodicka, Albert L., Aetna Porcelain Enameling Co., 4701 Augusta St., Chicago 51, Ill.
Vogl, Thomas P. (Student), 175 West 73rd St., New York 23, N. Y.
Vogt, Harold G., 212 Chemung St., Corning, N. Y.
Vollmer, August, Jr., St. Louis Pottery & Mfg. Co., 5240-46 Northrup Ave., St. Louis 10, Mo.
Vollrath Co. (Jean C. Vollrath), 18th and Michigan Aves., Sheboygan, Wis.
Vollrath, A. J., 2123 North 6th St., Sheboygan, Wis.
Vollrath, Jean C., Vollrath Co., 18th and Michigan Aves., Sheboygan, Wis.
Vontury, Frances J., Lehigh Ave., Perth Amboy, N. J.
Voorhies, John H., 4770 Kester Ave., Sherman Oaks, Calif.
Voss, Raymond O., 26 Pershing St., Corning, N. Y.
Voss, Walter C., Massachusetts Inst. of Tech., Rm. 7-221, Cambridge 39, Mass.

Waggoner, Jack H., 240 Quentin Rd., N., Newark, Ohio
Wagner, Bruce F., 421 Repton Rd., Riverside, Ill.
Wagner, Rio B., 4540 E. Main St., Columbus, Ohio
Wainer, Eugene, 2654 Whirlpool St., Niagara Falls, N. Y.
Waite, Virgil H., 433 Beech St., Berea, Ohio
Walden, Albert S., National Carbon Co., Cleveland, Ohio
Walker, A. M., Australian Tesselated Tile Co., Mitcham, Victoria, Australia
Walker, Herbert M., Walker China Co., Bedford, Ohio
Walker, Howard E., Owens-Corning Fiberglas Corp., Research Labs., Newark, Ohio
Walker, Prescott H., Carborundum Co., Niagara Falls, N. Y.
Walker, Richard O., Jr., 2419 Bexley Park Rd., Columbus 9, Ohio
Wallace, Curtis C., Electric Storage Battery Co., Allegheny Ave. and 19th St., Philadelphia 32, Pa.
Wallace, William W., Box 628, Redlands, Calif.
Walsh Refractories Corp. (J. L. Crawford), 4070 North 1st Street, St. Louis 7, Mo.
Walsh, Donald E., 2507 St. Clair Ave., East Liverpool, Ohio
Walsh, F. A., Gladding, McBean & Co., Lincoln, Placer County, Calif.
Walsh Walsh, John, Ltd. (W. G. Riley), Soho & Vesta Glassworks, Birmingham 18, England
Walsh, N. S. C., 4070 N. First St., St. Louis 7, Mo.
Waltham Grinding Wheel Co. (Robert L. Lyons), Waltham, Mass.
*†Walton, S. F., Exolon Co., Tonawanda, N. Y.
Walworth, Chester A., Libbey-Owens-Ford Glass Co., Box 2707, Charleston 30, W. Va.
Wampler, Roy W., Libbey-Owens-Ford Glass Co., Technical Bldg., 1701 E. Broadway, Toledo 5, Ohio
Ward, Charles J., 22 Bracondale Hill Rd., Toronto 10, Ontario, Canada
Ward, George V., South Shore, Ky.
Ward, George W., Midwest Research Inst., 4049 Pennsylvania, Kansas City 2, Mo.
Ward, K. E., United Clay Mines Corp., Oakland and Prospect Sts., Trenton 6, N. J.
Ward, S. Paul, 605 Mission St., South Pasadena, Calif.
Wardley, Thomas, Westpoint Rockware Ave., Greenford, Middlesex, England
Warren, Bertram E., Massachusetts Inst. of Tech., Cambridge 39, Mass.
Waschler, Albert L., General Refractories Co., Box 1673, Baltimore 3, Md.
Washburn, Lt. (jg) C. Eldyn, San Francisco, Calif.
Washington Brick Co. (Thomas Somerville, III), Muirkirk, Md.
Washington Porcelain Co. (C. H. Ackerson), Willow St., Washington, N. J.
Watkin, Robert W., 2505 St. Clair Ave., East Liverpool, Ohio
Watkins, Edward H., 947 Center St., Wellsville, Ohio
Watkins, George B., Libbey-Owens-Ford Glass Co., 1701 E. Broadway, Toledo, Ohio
Watkins, Joel H., Charlotte Court House, Va.
Watkins, Ray T., U. S. Tariff Commission, Ceramic Div., Washington, D. C.
Watkins, W. J., Kentucky Clay Mining Co., Mayfield, Ky.
Watson, William, Primrose Brick Works, Ltd., Germiston, South Africa
Watt Pottery Co. (Loren Watt), Crooksville, Ohio
Watt, Loren, Watt Pottery Co., Crooksville, Ohio
Watts, Lt. Arthur P., Ruxton, Baltimore 4, Md.
*†Watts, Arthur S., Lord Hall, Ohio State Univ., Columbus 10, Ohio
Watts, E. F., Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.

Watts, Gerald F., A. E. Hull Pottery Co., Crooksville, Ohio
Wayne Labs. (John J. Shank), 17 E. Main St., Waynesboro, Pa.
Weathers, W. M., International Smelting & Refining Co., 577 Malvern Rd., Akron 3, Ohio
Weaver, B. D., Nepheline Products, Ltd., Lakefield, Ontario, Canada
Weaver, H. F., Peerless Pottery, Inc., 917 N. St. Joseph Ave., Evansville 12, Ind.
*Weaver, R. A., Ferro Enamel Corp., 4150 East 56th St., Cleveland 5, Ohio
Webb, Herbert, Coalbournhill Glass Works, Stourbridge, Worcestershire, England
Weber, Alfred E. (Student), 2617 Knapp St., Ames, Iowa
Weber, August, Jr., 1155 Stratford Rd., Schenectady 8, N. Y.
†Webster, Charles E., 311 E. Beaver St., Zelienople, Pa.
Webster, Hugh B., Harshaw Chemical Co., 12 South 12th St., Philadelphia 7, Pa.
Webster, Paul A., Moravia Rd., Avon, Conn.
Wedemeyer, N. G., Röhm & Haas Co., 222 W. Washington Sq., Philadelphia 5, Pa.
Wehtje, Ernst, Postbox 129, Malmö, Sweden
Wehtje, Karl F., A/B Rörstrands Porslinsfabriker, Lidköpings Porslinsfabrik, Lidköping, Sweden
Weidman, V. Wesley, 3105 West 2nd St., Apt. B, Wilmington 172, Del.
Weil, Edgar H., Vitreous Steel Products Co., Newburg Sta., Cleveland 5, Ohio
Weinfurtner, E. M., North American Refractories Co., National City Bank Bldg., Cleveland 14, Ohio
Weinheimer, Peter F., Interlake Iron Corp., Perry Plant, foot of Wayne St., Erie, Pa.
Weinstein, Alex, Ednal Co., 95 Madison Ave., New York 16, N. Y.
†Weis, J. H., 90 Hamilton St., Cambridge 39, Mass.
Weiske, Ino (Student), Box 353, Mission, Texas
Weiss, E. Joseph (Student), 73 N. Cassingham Rd., Columbus, Ohio
Weiss, W. Russell, Wellsville, Mo.
Welch, Arnold P., 1032 Colony St., Saskatoon, Saskatchewan, Canada
Welch, Richard L., Dominion Firebrick & Clay Products, Ltd., Claybank, Saskatchewan, Canada
*Weldon, Walter A., 621 Edgewood St., Baltimore 29, Md.
Wellech, Edmund H., 75 W. Fifth St., Corning, N. Y.
Weller, Harvey C., Surface Combustion Corp., 2375 Dorr St., Toledo 1, Ohio
*Wells, A. A., Homer Laughlin China Co., Newell, W. Va.
Wells, Joseph, Homer Laughlin China Co., Newell, W. Va.
Wells, Lloyd L., Jr., 7851 S. Coles Ave., Chicago 49, Ill.
Welshans, Lewis T., 404 Mentor Ave., Painesville, Ohio
Welter, J. T., R. D. 3, Tiffin, Ohio
Wenczel, Stephen, New Jersey Porcelain Co., Box 908, Trenton 5, N. J.
Wendt, J. P., Crown Potteries Co., Evansville 7, Ind.
Wendt, Nelson E., American Potash & Chemical Corp., 122 East 42nd St., New York 17, N. Y.
Wenger, A. H. C., Messrs. Wengers, Ltd., Etruria, Stoke-on-Trent, England
Wenning, W. F., Ceramic Color & Chemical Mfg. Co., Box 297, New Brighton, Pa.
Werner, Alan J., 159 Watauga Ave., Corning, N. Y.
Wessels, Vincent E., Petoskey Portland Cement Co., Petoskey, Mich.
West, Lt. (jg) Carl, Jr., San Francisco, Calif.
West, Frank, Haslemere Greenlane, Buxton, Derbyshire, England
Westall, Charles C., Burns Apts., Kittanning, Pa.
Western Brick Co. (I. R. Cline), Danville, Ill.
Western Electric Co. (L. I. Shaw, 7420), Hawthorne Sta., Chicago 23, Ill.
Western Feldspar Milling Co. (J. W. Magnuson), 1333 W. Maple St., Denver 9, Colo.
Westinghouse Electric Corp. (John D. Harnish), Derry, Pa.
Westinghouse Electric Corp., Glass Plant (LeGrand Jarrett), Fairmont, W. Va.
Westlake, C. Rogers (Student), 432 Somonauc St., Sycamore, Ill.
*Westman, A. E. R., Ontario Research Foundation, 43 Queen's Park, Toronto 5, Canada
Westmont, O. B., Johns-Manville Products Corp., Lompoc, Calif.
†Weston, Ralph H., Arketex Ceramic Corp., Brazil, Ind.
West Virginia Brick Co. (Claude F. Wiseman), Charleston, W. Va.
Weyburne, F., Marshall-Eclipse Div., Bendix Aviation Corp., Box 538, Troy, N. Y.
Weyl, Woldemar, Glass Science, Inc., Pennsylvania State College, State College, Pa.
Wheaton, Frank H., Millville, N. J.
Wheaton, Frank H., Jr., 1118 N. High St., Millville, N. J.
Wheaton, L. Don (Student), T. C. Wheaton Co., Millville, N. J.
Wheaton, T. C., Co. (Frank H. Wheaton, Jr.), 1118 N. High St., Millville, N. J.
*Wheeler, Herbert A. (Charter Life), 321 Edgar Rd., Webster Groves, Mo.
Wheeler, Thorne L., Arthur D. Little, Inc., 30 Memorial Dr., Cambridge 42, Mass.
Wheeling Steel Corp. (Warren F. Copp), Yorkville, Ohio
Whelan, Paul T., 65 C St., Tonawanda, N. Y.
†Whitaker, Fred A., General Ceramics Co., Keasbey, N. J.
Whitaker, H., Rustless Iron Co., Ltd., Trico Works, Keighley, England
†Whitaker, L. R., Carolina Ceramics, Inc., Box 1257, Columbia, S. C.
Whitcomb, Robert L., Jr., 732 W. Pasadena St., Flint, Mich.
*White, Harold E., R. D. 6, "Windy Knoll," Butler, Pa.
White, Jonathan S., 1302 Singer Place, Wilkinsburg, Pittsburgh 21, Pa.
White, R. H., Alden Park Manor, Germantown, Philadelphia, Pa.
Whiteley, Joseph O., Dentists' Supply Co., York, Pa.
Whitener, Cadet William J. (Student), West Point, N. Y.
Whitesell, Lysle E., Wellsville, Mo.
Whitesell, Robert J., 8313 Roberts Rd., Elkins Park 17, Pa.
Whitfield, R. E. (Student), 414 N. Worth St., Sullivan, Ill.
*Whitford, William G., Graduate Education Bldg., Box 30, Univ. of Chicago, Chicago 37, Ill.
Whitmer, J. D., Sparta Ceramic Co., East Sparta, Ohio
Whitney, Eugene H., Box 630, Pittsburg, Calif.
Whittaker, Clyde M., Box 391, New Castle, Pa.
†Whittaker, Harry, 470 Edgell Rd., Framingham Center, Mass.
*†Whittemore, J. W., Virginia Polytechnic Inst., Blacksburg, Va.
Whittemore, O. J., Vincent Clay Products Co., Box 603, Fort Dodge, Iowa
†Whittemore, O. J., Jr., Rm. 4-049, Massachusetts Inst. of Tech., Cambridge 39, Mass.
Whittington, Lloyd R., 844 Valdes Ave., Akron, Ohio
Wiedemann, H. E., Chemical Bldg., St. Louis 1, Mo.
Wiker, Richard M., 206 Rand Ave., Painted Post, N. Y.
Wilcox, Herman G., 742 Loretta St., Pittsburgh 17, Pa.
Wildblood, Norman R., Blythe Colour Works, Ltd., Cresswell, Stoke-on-Trent, England
*Wilkes, Gordon B., Massachusetts Inst. of Tech., Cambridge 39, Mass.
Willems, H. W. V., 215 Cedar St., Corning, N. Y.
†Williams, Alan B., 2908 Lombardy Court, Augusta, Ga.
Williams, Arthur E., 1011 Parriott Ave., Moundsville, W. Va.
Williams, Charles K., 351 Ogden St., East Liverpool, Ohio
Williams, Clyde E., Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio

Williams, Francis J., National Lead Co., Research Labs., 105 York St., Brooklyn, N. Y.
Williams, George F., 130 Platt St., Painted Post, N. Y.
Williams, Harry M., 31 Carlton Ave., R. D. 6, Trenton, N. J.
Williams, H. T., R. Thomas & Sons Co., Lisbon, Ohio
Williams, John A., Box 250, Trenton 2, N. J.
Williams, Robert A., Franklin Tile Co., Lansdale, Pa.
†Williams, Walter E., 1519 Myrtle Ave., Zanesville, Ohio
Williams, Warren S., 4118 East 56th St., Maywood, Calif.
Willis, James B., 1355 Crofton Rd., Baltimore 12, Md.
Willson Products, Inc. (Thomas A. Willson), Box 622, Reading, Pa.
Willson, Herbert S., 256 Bridge St., Corning, N. Y.
Willson, Thomas A., Willson Products, Inc., Box 622, Reading, Pa.
Wilson, Ashley F., Jr., Lisk Mfg. Co., Ltd., Canandaigua, N. Y.
Wilson, Calvin S., 265 Bloomfield, Toledo 9, Ohio
Wilson, Charles L., 309 N. Meridian St., Brazil, Ind.
Wilson, Earl O., 777 Alden Rd., Claremont, Calif.
Wilson, George, 131 Edison Ave., New Castle, Pa.
*†Wilson, Hewitt, 12 W. Circle Rd., Norris, Tenn.
Wilson, Maurice S., 95 Myrtle St., Shelton, Conn.
Winand, William T., 901 McKewin Ave., Baltimore 18, Md.
Winburn, H. L., Box 1735, Little Rock, Ark.
Winburn, Sinclair W., Box 1735, Little Rock, Ark.
Windisch, Robert P., Roseville Pottery, Inc., Zanesville, Ohio
Winemiller, William F., Research & Development Service Sub-Office, OCO (Pinto), Box 210, Cumberland, Md.
Winship, William W., Thermal Syndicate, Ltd., 12 East 46th St., New York 17, N. Y.
Winston, Lydia K., 483 Aspen Rd., Birmingham, Mich.
Winstone's Roofing Tile Works, Ltd. (C. G. Hillier), Taumarunui, North Island, New Zealand
Winter, Aniuta, "Ecole Libre des Hautes Etudes," 66 5th Ave., New York 11, N. Y.
Winters, F. T., Pacific Coast Borax Co., 51 Madison Ave., New York 10, N. Y.
Wisconsin Porcelain Co. (L. A. Stohl), Sun Prairie, Wis.
Wise, L. G., E. I. du Pont de Nemours & Co., Inc., Chemical Dept., Exptl. Sta., Wilmington, Del.
Wisely, Harriet R. (Student), 530 E. Green St., Champaign, Ill.
Wiseman, Claude F., West Virginia Brick Co., Charleston, W. Va.
Wishart, A. W., Corning Glass Works, Charleroi Plant, Charleroi, Pa.
Wishart, L., Vereeniging Brick & Tile Co., Ltd., Box 49, Vereeniging, Transvaal, South Africa
Wishoski, I. Stanley, Editor, *Industrial Heating*, 1400 Union Trust Bldg., Pittsburgh 19, Pa.
Wiss, J. E., 1339 Lincoln Rd., Columbus 8, Ohio
Witkowski, Stanley, 60 Harding Ave., Oaklyn, N. J.
Witschey, R. A., A. P. Green Fire Brick Co., 122 S. Michigan Ave., Chicago 3, Ill.
*†Wolfram, H. G., Pemco Corp., Baltimore 24, Md.
Wolfskill, J. M., Bliley Electric Co., Union Sta. Bldg., Erie, Pa.
Womeldorph, Raymond C. (Student), Lovettsville, Va.
Wong, Po Kay (Student), 1055 Washington St., San Francisco 8, Calif.
Wood, Kenneth O., 3140 Live Oak St., Huntington Park, Calif.
Wood, Lewis C., Braden Copper Co., Rancagua, Chile
Woodall, Edward L., Jr. (Student), 408 S. Fourth St., Smithfield, N. C.
Woodruff, Ernest W., 219 E. North Water St., Chicago 11, Ill.
Woods, William J., Box 627, Lewistown, Pa.
Woodville Lime Products Co. (J. Robert Cowell, Jr.), 2140 Jefferson Ave., Toledo, Ohio
Woody, Fred C., 13810 Cranwood Park Blvd., Cleveland 5, Ohio
Wooley, Seward E., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio
Worcester Royal Porcelain Co., Ltd. (Joseph F. Gimson), Royal Porcelain Works, Worcester, England
*†Worcester, W. G., Dept. of Ceramics, Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada
Work, Harold K., Jones & Laughlin Steel Corp., Research & Development Div., 40 Longworth St., Pittsburgh 7, Pa.
Work, Lincoln T., Metal & Thermit Corp., Box 255, Rahway, N. J.
Wortley, G. W., R. & A. Main, Ltd., Gothic Works, Falkirk, Scotland
Wright, Ann T., 121 Clifton Ave., Minneapolis 4, Minn.
Wright, Daniel K., Incandescent Lamp Dept., General Electric Co., Nela Park, Cleveland 12, Ohio
Wright, David (Student), 179 Edgar St., Welland, Ontario, Canada
†Wright, Edward P., Box 387, East Liverpool, Ohio
Wright, Fay L., 339 N. Maryland Ave., Glendale 6, Calif.
Wright, J. E., Messrs. A. G. Hackney & Co., Ltd., Fairfield Pottery, Hanley, Stoke-on-Trent, England
Wright, J. W., 1129 Warren St., Alton, Ill.
Wright, Russel, 7 Park Ave., New York, N. Y.
Wulf, Charles A., American Valve & Enameling Corp., Box 114, Indianapolis 6, Ind.
Wurtsbaugh, C. G., 11638 Otsego St., North Hollywood, Calif.
Wyatt, De Witt H., 123 Acton Rd., Columbus, Ohio
Wyche, Ernest H., 1874 Niagara Ave., Niagara Falls, N. Y.
Wyckoff, Lewis B., Electro Metallurgical Co., Niagara Falls, N. Y.
Wyckoff, Wilbur R., 262 Cleveland Ave., Hasbrouck Heights, N. J.
Wysor, D. C., General Chemical Co., 40 Rector St., New York 6, N. Y.

Yanovsky, Alexander, 16 Izola Ave., Fords, N. J.
Yarte, Andrew A., Apartado 486, Monterrey, N. L., Mexico
Yavorsky, Paul J., 3028 Porter St., N. W., Washington 8, D. C.
Yates, Paul L., Crane Co., Chattanooga Div., Box 551, Chattanooga, Tenn.
Young, John C., 7126 Middleton St., Huntington Park, Calif.
Young, Robert J., Chicago Hardware Foundry Co., North Chicago, Ill.
Young, Robert W. (Student), 3 Pulsifer Ave., Yonkers, N. Y.
†Young, Willard G., W. A. Case & Son Mfg. Co., 33 Main St., Buffalo, N. Y.
Young, W. O., 1796 Tonawanda Ave., Akron 5, Ohio
Yount, Richard V., CWS Development Labs., Massachusetts Inst. of Tech., Cambridge, Mass.
Yu, Edwin P., Victor Insulators, Inc., Victor, N. Y.
Yu, Wen-Te (Student), 1010 W. Illinois, Urbana, Ill.

Zabawsky, Zeno, 3808 Garfield St., N. W., Washington 7, D. C.
Zahn, William A., 370 Central Ave., Orange, N. J.
Zahniser, George B., 109 Englewood Ave., New Castle, Pa.
Zapfe, Richard C., 162 Penfield St., Pomona, Calif.
Zapffe, Carl A., 6410 Murray Hill Rd., Baltimore 12, Md.
Zapun, C. G., Zapun Ceramics, 4300 36th St., Long Island City, N. Y.
Zarbo, George, Fenimore St. near Second, Vineland, N. J.
Zehm, Robert C., Joseph Dixon Crucible Co., Jersey City, N. J.
Zeiller, Irwin F., B. F. Drakenfeld & Co., Inc., 45–47 Park Place, New York 7, N. Y.
Zeiller, Oscar F., 42–38 204th St., Bayside, Long Island, N. Y.

Zerfoss, Samuel, 226 Mineral Industries Bldg., State College, Pa.
Zimmer, Daniel B., 1381 Sedgwick Ave., New York, N. Y.
†Zimmer, David C., Patterson Foundry & Machine Co., East Liverpool, Ohio
Zimmer, Karel, Box 183, Mineola, N. Y.
Zinszer, William K., R. D. 2, Box 167, Concord, Calif.
†Zvanut, Frank J., Ferro Enamel Corp., 4150 East 56th St., Cleveland, Ohio
Zweig, Benson (Student), Apartment 511, 4607 Connecticut Ave., N. W., Washington, D. C.
†Zwermann, Carl H., Casa, Presidio of Monterrey, Monterrey, Calif.

ADDITIONAL NAMES

Avakian, Victoria, School of Architecture and Allied Arts, Univ. of Oregon, Eugene, Ore.
Baldry, S. F., 1021A, Finchley Rd., London, N. W. 11, England
Childs, H. W., United Feldspar & Minerals Corp., West Paris, Maine
Garfield Refractories Co. (Kenneth A. Rugh), Bolivar, Pa.
Haecker, Arthur J., Jr., 510 Tebeau St., Waycross, Ga.
Hepner, Leonard H., Trenton Potteries Co., Box 141, Plant 5, Trenton 1, N. J.
Hunt, Frank S., 2780 Estado St., Pasadena 8, Calif.
Leatham, Earl, Apt. F-18, Brentshire Village, Pittsburgh 10, Pa.
Lindroth, Stig A., Erik Dahlbergsgatan 56, Gothenburg, Sweden
Loomis, Wayland E., Hartford-Empire Co., Hartford, Conn.
McDermott, James J., Jr., 80 William St., New York 7, N. Y.
Norris, Alan W., 12A, Mayfield Ave., Keele Rd., Newcastle-under-Lyme, Staffordshire, England
Parsons, Douglas E., Clay and Silicate Products Div., National Bureau of Standards, Washington 25, D. C.
Webber, Maj. John J., New Orleans, La.

ADDRESSES OF SERVICEMEN

Owing to the rapidly changing conditions at the time this Roster is being issued, it is necessary to make special arrangements for men with service addresses. Where a military address is being used, it has been cut to the name of the city only. If you have occasion to write any of these men, we shall be glad to furnish the latest addresses.

To those members whose addresses have been so listed we make a special request to keep this office informed of your whereabouts.

THIS ROSTER

This Roster of The American Ceramic Society is the Who's Who of the ceramic industry. Here are listed the names of men who are making ceramic history. In the past two years five hundred names have been added to this list. Many more are being added every month.

During the coming year many servicemen will be discharged and return to the industry. Their correct addresses will be published in The Bulletin each month.

You can use this Roster to keep in touch with the men in your industry.

THE AMERICAN CERAMIC SOCIETY, INC.

2525 N. High Street **Columbus 2, Ohio**

THE PRESIDENT'S PAGE

A MOST IMPORTANT COMMITTEE

By C. Forrest Tefft

The Research Committee of The American Ceramic Society is one of the most important influences in the advancement of ceramic science. It is this Committee which accumulates reports on research work and presents them for the information of the industry.

The Committee in 1944–1945 was headed by A. A. Wells. The other members were for Enamel, J. C. Reimers; Glass, Alexander Silverman, Oscar G. Burch, and C. E. Leberknight; Materials and Equipment, R. R. Robinson; Refractories, E. C. Petrie; Structural Clay Products, G. A. Bole and H. C. Plummer; White Wares, Ralston Russell, Jr., and Glenn Howatt.

The report of this Committee was published in the July, 1945, *Bulletin*, pp. 253–59. Each section shows remarkable coverage of the field. The extent of the report is an indication of the progress of the industry. Only the Design Division was absent in this list of accomplishments, as there was no representative of this group on the Committee.

As I said on this page in the July *Bulletin*, "Committee membership is a stimulating experience." I am sure that the members of the Research Committee found it so when they had the privilege of gathering and editing the results of a year of research for the entire industry.

Look at the sections. In Enamel, the influence of molybdenum in enamels and the use of titanium in enameling iron and steel, the test for thermal shock and abrasion resistance, and the development of coatings for resistors are all covered.

In Glass, the further refinements of control, new compositions, and the effect of humidity on surfaces are discussed.

In the Materials and Equipment Division, new uses of an increasing number of the nonmetallic minerals was covered as well as a fundamental study of the properties of clay and the use of X-ray equipment in control.

In the Refractories Division, the development of a satisfactory lightweight refractory that would meet Navy requirements, the study of various compositions especially resistant to thermal shock, and special studies of materials are given.

In the Structural Clay Products field, the effect of moisture penetration on masonry walls, the ceramic stove, and new mortar combinations are reported and analyzed.

In the White Wares Division, the rapid improvement in the electrical properties of bodies, leadless glazes, and new methods in color control are presented for industry consideration.

The Research Committee of The Society does not sponsor or supervise any of this work, nor has it been possible in the recent past for The Society to underwrite any of it. Several research projects have been conducted by Divisions, but in general the work of the Research Committee and the Division committees has been to compile and publish the results. This in itself is a big service to the industry and to the profession.

C. Forrest Tefft, President, The American Ceramic Society

It is reassuring to anyone doing original research work to know that some organization stands ready to take note of his accomplishments and to publish his findings. The organization of the Research Committee and its review of the work done in any year is assurance that scientific study in our industry, no matter how theoretical and abstruse, will be noted and encouraged.

Although the Research Committee is not at present able to lend financial assistance to any of this work, it may be possible in the future for The Society to act as the coordinating agent for projects which are too much in the realm of pure science to be sponsored by any one company. Perhaps the demand for this type of investigation will become so strong that The American Ceramic Society will be called upon to raise a technical service fund, or secure contributions to the support of this type of research work.

In the meantime, you can use the results of this Committee's work. You can keep ahead of the technology of your industry by having reports of this kind at your disposal. You can help the Research Committee by cooperating in bringing original material to the attention of this group and in helping with the work for your division of the industry.

The work of the Research Committee is an important function of The American Ceramic Society. Keep yourself informed of the advancements in the science of the industry by reading these reports.

LOCAL SECTION NEWS

SCHEDULE OF LOCAL SECTION MEETINGS

Section and Place	Date
New York Metropolitan, New York	October 17
Northwestern Ohio, Toledo	October 18 and December 6
Southern California, Los Angeles	October 20 and November 8
Northern Ohio, Cleveland	November 2 and December 6
Pittsburgh, Pittsburgh	November 13
Upstate New York, Hornel	November 16
St. Louis, St. Louis	December 5
Central Ohio, Columbus	December 7
Chicago, Chicago	December 14

NORTHERN OHIO SECTION

The Executive Committee of the Northern Ohio Section met at the Cleveland Engineering Society September 12. Attending were R. M. Bowman, D. P. Brown, H. D. Carter, D. R. Goetchius, J. E. Hansen, E. M. Sarraf, B. J. Sweo, and S. M. Swain.

Plans were discussed for the first Autumn Session, involving an afternoon and evening meeting Friday, November 2, in the main auditorium of the Cleveland Engineering Society. A program of technical papers (prepared originally for last spring's Annual Meeting) will be presented, with a dinner and entertainment. On the following afternoon, the Navy-Notre Dame football game will be played at the Cleveland Municipal Stadium.

Vacancies in the Section's organization were filled by action of the Executive Committee, and complete personnel is as follows:

Chairman: E. M. Sarraf, Harbison-Walker Refractories Co.
Vice-Chairman: H. D. Carter, Harshaw Chemical Co.
Secretary-Treasurer: S. M. Swain, North American Refractories Co.
Councillor: R. M. Bowman, Republic Steel Corp.
Chairman Program Committee: B. J. Sweo, Ferro Enamel Corp.
Chairman Membership Committee: J. W. Iliff, Harshaw Chemical Co.
Chairman Social Committee: D. R. Goetchius, Ferro Enamel Corp.
Chairman Publicity Committee: S. M. Swain.
Chairman C.T.S.C. Golf Committee: D. P. Brown, North American Refractories Co.

Later programs are planned at the Cleveland Engineering Society on December 6, 1945, and February 7, April 4, and June 6, 1946. The February meeting will be the Section's Annual Meeting, including election and installation of officers for the calendar year 1946.

—E. M. Sarraf, *Chairman*

SOUTHERN CALIFORNIA SECTION

A meeting of the Southern California Section was held September 19, 1945, at Baux Restaurant, Los Angeles, Calif. Attendance was sixty-six. Our speaker was Robert Gray, director of the Industrial Relations Section, California Institute of Technology, who spoke on "Present-Day Trends in Labor Relations." Professor Gray is a very able and interesting speaker and discussed many questions from the floor after his talk.

Our annual social event will be held October 20 at the Rio Hondo Country Club. G. E. Sievert and Gordon Stewart are in charge of the arrangements.

The next business meeting will be November 8 at Baux Restaurant. Representatives of the Southern California Gas Company will discuss "The Fuel Situation in Southern California." This Company has a film in process, which will be ready to show at that time.

Our annual meeting will be in January, and we plan to have Perry Helser, Gladding, McBean & Co., talk on The American Ceramic Society, with the object of stimulating greater membership.

—C. S. Chaffee, *Chairman*

DESIGN DIVISION OF SOUTHERN CALIFORNIA SECTION

Correction: Marion Stockton is Secretary-Treasurer of the Design Division of the Southern California Section, rather than Hildreth Reents, as listed in the September, 1945, *Bulletin*, page 341.

PITTSBURGH SECTION

On Friday, September 14, the members of the Pittsburgh Section were guests of the East Liverpool District members for a combination plant trip and ox roast.

Members met at the Travelers Hotel in East Liverpool about 1:00 P.M. and divided into groups which visited the Homer Laughlin China Company, the Edwin M. Knowles China Company, and the Hall China Company. Following these interesting plant trips, about 200 persons went to the East Liverpool Country Club where the committee in charge of Arthur Wells was roasting a 1000-lb. steer by infrared. This barbecue method was an original idea; and after cone 12 went down, a wonderful dinner was served at which six choice door prizes were awarded.

Everyone pronounced the day a big success and those who visited expressed their appreciation to the East Liverpool members.

—Howard Parkhurst, *Secretary*

MICHIGAN SECTION

The Michigan Section held a joint meeting with the Engineering Society of Detroit at the Rackham Memorial Auditorium Tuesday, September 25. About 500 were present.

At the dinner which preceded the meeting, Tony Weitzel, columnist of *The Detroit Times*, gave a humorous talk. The main program started at 8:00 P.M. with a film by the U. S. Bureau of Mines, "The Story of the Spark Plug."

John Quirk, Chairman of the Michigan Section, presided. C. Forrest Tefft, President of The American Ceramic Society, was present and spoke briefly.

Robert A. Weaver, president of the Ferro Enamel Corp., Cleveland, Ohio, spoke on the subject "An Ancient Art Becomes a Modern Industry." He brought the enameling industry up through the years and finished with a suggestion of the engineer's place in the new scientific world that is developing from the war. He made a strong plea for engineer participation in world politics.

After his address, Dr. Weaver answered questions with the assistance of J. E. Hansen, Director of Service, Ferro Enamel Corporation, and Vice-President of The American Ceramic Society.

NORTHWESTERN OHIO SECTION

The Northwestern Ohio Section has scheduled the following meetings and speakers for the winter season:

December 6, 1945: Talk entitled "Modern History of Flat Glass" by John L. Drake, director, Engineering Div., Libbey-Owens-Ford Glass Co., Toledo 5, Ohio.
January, 1946: Talk entitled "Glass and the Astronomer, from Galileo to the Two-Hundred-Inch Disk" by J. C. Hostetter, Mississippi Glass Co., St. Louis 7, Mo.
March, 1946: Talk on mechanical and patent development of the glass-container industry by L. D. Soubier, Patent Dept., Owens-Illinois Glass Co., Toledo, Ohio.

—Harold A. McMaster, *Secretary*

ST. LOUIS SECTION

The St. Louis Section held its first meeting of the autumn season October 3, 1945, at the Forest Park Hotel, St. Louis, Mo. Forty-eight were present.

Following dinner, a program was presented which consisted of an interesting film on glassmaking in England.

Addition to Membership Committee

R. O. Cox, Day-Brite Lighting, Inc., St. Louis, Mo., has been appointed to serve on the Membership Committee for 1945–1946. Other members of this Committee are listed on page 303 of the August, 1945, *Bulletin*.

—HENRY W. MEYER, *Chairman*

NOTE—See later report, page 408.

NEW YORK METROPOLITAN SECTION

The New York Metropolitan Section will hold its inaugural meeting Wednesday evening, October 17, at the Building Trades Employers Association Building, 2 Park Ave., New York, N. Y. "Fiberglas and Its Applications, War and Postwar" will be the subject of a talk presented by Jan S. Irvine, eastern manager of the Owens-Corning Fiberglas Corporation. The business of the evening will include election of officers for the coming year.

C. Forrest Tefft, President of The American Ceramic Society, will present the Charter to the Section at this meeting. Charles S. Pearce, Associate Secretary of The Society, will attend.

The Organizing Committee for the new Section consists of James B. Austin, Research Lab., U. S. Steel Corp.; James F. Barns, Carnegie-Illinois Steel Corp.; J. C. Crawford, Johns-Manville Sales Corp.; Robert M. Curts, American Potash & Chemical Corp.; Cyril B. Delgado, *Glass Industry;* Emerson W. Emrich, R. T. Vanderbilt Labs.; Frank J. Fallon, B. G. Corporation; Perry C. McCollom, American Crucible Co.; Rexford Newcomb, Jr., Brickseal Refractory Co.; Robert H. H. Pierce, Jr., Research Lab., U. S. Steel Corp.; Elmer Rosenberg, Demuth Glass Works, Inc.; Robert F. Sherwood, United Feldspar & Minerals Corp.; James D. Tetrick, Metal & Thermit Corp.; C. C. Treischel, R. T. Vanderbilt Co.; and Joseph A. Pask, Lamp Div., Westinghouse Electric Corp., Chairman.

PITTSBURGH SECTION

The November meeting of the Pittsburgh Section is scheduled for Tuesday, November 13, at Mellon Institute. The meeting, which starts at 8:15 P.M., will be preceded by dinner at Webster Hall at 6:30 P.M., with the ladies invited.

In keeping with the unusually fine meetings of the current season, the Section is fortunate in securing A. Nadai, consulting mechanical engineer of the Westinghouse Research Laboratories, East Pittsburgh, whose subject will be "Trip to Russia."

During the second half of June, 1945, a series of meetings was scheduled in Moscow and Leningrad, in connection with the celebration of the 220th anniversary of the Academy of Sciences of the Union of Soviet Socialist Republics. Sixteen Americans and one Mexican were invited to attend these meetings at which 160 foreign and 800 Russian scientists were present as guests of the Academy. The Academy also arranged transportation to and from Russia by plane for all foreign guests. As one of the participants from the United States, Dr. Nadai will tell about the journey which took him around the earth, about the sessions he attended, and the impressions of his stay of sixteen days in the Soviet Union.

Dr. Nadai, now an American citizen, is a native of Budapest, Hungary. He was trained at the Federal Technical Institute in Zurich, Switzerland, and came to Westinghouse in 1927 from the Professorship of Applied Mechanics at the University of Goettingen, Germany.

With his background and his opportunities for observation, Dr. Nadai's comments on the progress of Soviet science should be of real interest to both members and their families.

—J. S. NORDYKE, *Chairman, Publicity Committee*

CENTRAL OHIO SECTION

A. R. Blackburn, Engineering Experiment Station, Ohio State University, Columbus 10, Ohio, has been appointed secretary of the Central Ohio Section to succeed John Marquis, who is leaving to join the organization of the Pemco Corp., Baltimore, Md.

ASSOCIATIONS

CERAMIC SOCIETY OF THE SOUTHWEST

The seventh program meeting of the Ceramic Society of the Southwest will be held in Austin, Texas, Friday and Saturday, October 26 and 27, 1945.

Friday, October 26

Plants of the Elgin Butler Brick Company and the Elgin Standard Brick Company, Elgin, will be visited at 9:30 and 11:00 A.M., respectively. A barbecue lunch will be served as a courtesy of the two plants at 12:30 P.M.

The Friday program session will be held in Room 202, Engineering Bldg., University of Texas, at 2:30 P.M. The following program will be presented:

(1) Address of Welcome by J. C. DOLLEY, vice-president, University of Texas.

(2) "Department of Ceramic Engineering, University of Texas" by F. K. PENCE.

(3) "Electronic Treatment of Texas Clays" by DAVID HARRELL, JR.

(4) "Research on Properties of Brick and Tile Clays" by ROBERT H. ANWYL.

(5) "Use of Engobes in Ceramic Decorations" by BRUCE BLOUNT.

(6) "Dry-Press Data" by E. W. JACKSON.

A discussion by Charles Sewell will conclude the session.

Following dinner at 7:30 P.M. in the East Room of the Hotel Stephen F. Austin, an address will be presented by WALTER T. ROLFE, chairman, Dept. of Architecture, University of Texas. A discussion by visiting architects will follow.

Saturday, October 27

The Saturday program session will be held in the Sun Room, Hotel Stephen F. Austin, at 9:30 A.M. TOM BUTLER, JR., will talk on "Labor-Saving Devices in a Brick and Tile Plant: Loading and Unloading Trucks, Bringing Clay to Dry Pans, Handling Product in and out of Kilns, Belt to Drier, Drier to Kilns." FRANK MAHURIN, RAY PAFFORD, AND CHARLES T. BELL will follow with discussions.

A football game (Rice Institute vs. University of Texas) will be held at 2:30 P.M. Football tickets are $2.50 each. Send check or reservations to the Secretary.

In making reservations at the Hotel Stephen F. Austin, be sure to state that you are attending the convention of the Ceramic Society of the Southwest.

—F. K. PENCE, *Secretary-Treasurer*

CERAMIC ASSOCIATION OF NEW YORK

The annual meeting of the Ceramic Association of New York will be held Saturday, November 17, the day following the Upstate New York Section meeting in Hornell, N. Y. It will consist of an all-day session at the New York State College of Ceramics, Alfred, N. Y. For particulars, kindly contact Dean M. E. Holmes, Secretary-Treasurer of the Association.

MAXWELL GENSAMER HEADS DEPARTMENT AT PENN STATE

Maxwell Gensamer, formerly professor of metallurgical engineering at the Carnegie Institute of Technology, Pittsburgh, Pa., has been associated with The Pennsylvania State College, State College, Pa., since May 1, 1945. He is professor of metallurgy and head of the Department of Mineral Technology, which includes the Divisions of Fuel Technology, Ceramics, and Metallurgy.

Biography

Dr. Gensamer was born June 3, 1902, in Bradford, Pa. He was graduated from the McKeesport High School in 1920 and attended the Carnegie Institute of Technology, Pittsburgh, Pa., where he received the B.S. and M.S. degrees in metallurgical engineering in 1924 and 1931, respectively, and the D.Sc. degree in 1933.

Professional Experience

During his school years, Dr. Gensamer was employed in various steel mills and foundries. After his graduation from the Carnegie Institute of Technology in 1924, he became associated with the Page Steel and Wire Co., Monessen, Pa., where he was successively galvanizing foreman (September, 1924, to March, 1925), chemist in charge of the laboratory (March to November, 1925), and assistant and acting chief metallurgist in charge of all heat-treatment and galvanizing, as well as laboratory foreman (November, 1925, to September, 1929).

He then returned to the Carnegie Institute of Technology as graduate student and research assistant in the Metals Research Laboratory. In June, 1933, he became a member of the Laboratory staff. He joined the teaching staff as assistant professor of metallurgy in July, 1935, and advanced to associate professor in July, 1938. He was professor of metallurgical engineering from July, 1943, to April, 1945.

Societies

Dr. Gensamer is a member of the American Institute of Mining and Metallurgical Engineers, the American Society for Metals, the American Association of University Professors, and the United States Institute of Naval Affairs. He is also a member of Phi Kappa Phi and Sigma Xi, honorary scientific fraternities.

Committees

Dr. Gensamer is chairman of the Executive Committee, Pittsburgh Chapter, American Society for Metals, and a member of the Publications Committee, Institute of Metals Division, American Institute of Mining and Metallurgical Engineers, the Weld Stress Committee, American Welding Society, and of numerous advisory committees to the National Defense Research Council (War Metallurgy Committee) of the Office of Scientific Research and Development.

Honors

Dr. Gensamer is the recipient of the Howe Medal of the American Society for Metals. He was also selected by this society to deliver the Annual Educational Lectures at the October, 1940, meeting; the Sauveur Memorial Lecture, 1944–1945; and the Campbell Memorial Lecture, 1945.

Publications

(1) (With J. F. Eckel and F. M. Walters, Jr.) "Alloys of Iron, Manganese, and Carbon: III, An X-Ray Study of Binary Iron-Manganese Alloys," *Trans. Amer. Soc. Steel Treating*, **19,** 599–607 (1931–1932).

(2) (With F. M. Walters, Jr.) "Alloys of Iron, Manganese, and Carbon: IV, A Dilatometric Study of Iron-Manganese Binary Alloys," *ibid.*, pp. 608–23.

Maxwell Gensamer

(3) "Alloys of Iron and Manganese: XII, Alloys of Iron and Carbon with 2.5 and 4.5 Per Cent Manganese," *ibid.*, **21,** 1028–34 (1933).

(4) (With R. F. Mehl) "X-Ray Study of Lüders' Lines and Strain Figures in Low-Carbon Steel," *Metals & Alloys*, **6** [6] 158–59 (1935).

(5) (With C. S. Barrett) "Stress Analysis by X-Ray Diffraction," *Physics*, **7** [1] 1–8 (1936).

(6) (With R. F. Mehl) "Preferred Orientations Produced by Cold Rolling Low-Carbon Sheet Steel," *Trans. Amer. Inst. Mining & Met. Engrs.*, **120,** 277 (1936).

(7) (With B. Lustman) "Preferred Orientations Produced by Recrystallizing Cold-Rolled Low-Carbon Sheet Steel," *ibid.*, **125,** 501 (1937).

(8) (With P. A. Vukmanic) "Preferred Orientations in Hot-Rolled Low-Carbon Steel," *ibid.*, p. 507.

(9) (With V. E. Thornburg) "Furnace for Treating Iron in Hydrogen at High Temperatures," *Metals & Alloys*, **8** [1] 11–12 (1937).

(10) "Yield Point in Metals," *Trans. Amer. Inst. Mining & Met. Engrs.*, **128,** 104–17 (1938).

(11) (With R. F. Mehl) "Yield Point of Single Crystals of Iron under Static Loads," *ibid.*, pp. 372–84.

(12) (With E. B. Pearsall and G. V. Smith) "Mechanical Properties of Isothermal Decomposition Products of Austenite," *Trans. Amer. Soc. Metals*, **28,** 380 (1940).

(13) "Static Crack Strength of Metals; Its Determination and Significance," *Metal Progress*, **38** [1] 59–64 (July, 1940).

(14) "Nature of Cold Work," *Modern Industrial Press*, Nov., 1940.

(15) "Preferred Orientations and Directional Properties in Sheets," *ibid.*, Feb., 1941.
(16) (With E. B. Pearsall, W. S. Pellini, and J. R. Low, Jr.) "Tensile Properties of Pearlite, Bainite, and Spheroidite," *Trans. Amer. Soc. Metals*, **30**, 983–1019 (1942).
(17) "General Utility of the Tension Test," *Modern Industrial Press*, April, 1942.
(18) "Flow and Fracture of Sheets under Combined Loads," *ibid.*, Sept., 1942.
(19) (With J. R. Low, Jr.) "Aging and Yield Point in Steel," *Trans. Amer. Inst. Mining & Met. Engrs.*, **158** (Jan., 1944).
(20) (With C. E. Lacy) "Tensile Properties of Alloyed Ferrites," *Trans. Amer. Soc. Metals*, **32** (1944).

EXPANSION OF CERAMIC WORK AT WEST VIRGINIA UNIVERSITY

The work in ceramics at West Virginia University, Morgantown, W. Va., is given in the Chemical Engineering Department as a Ceramic Option. This work was started in 1924 as a ceramic survey course. To this course were later added laboratory courses, a course in glass technology, and a course in refractories, the latter course being taken by the majority of chemical engineering students as an elective. A course in practical pottery was offered in summers.

Up to the summer of 1942, the work in ceramics, along with that in chemical engineering, was handicapped by lack of space in crowded Mechanical Hall. Purchase of new ceramic equipment had to be limited because space was not available. This was corrected in the summer of 1942 when the new Mineral Industries Building was completed and completely equipped.* This provided ample space for the Chemical Engineering Department, with two laboratories especially provided for ceramics. One of these rooms, 25 by 43 feet, is a general laboratory for instruction and special investigations. Directly across from the ceramic laboratory is the furnace and grinding room, also 25 by 43 feet. In addition, all the facilities of the Chemical Engineering Department are available for ceramic instruction and research. The ceramic equipment is likewise available for chemical engineering work. There is thus a saving in duplication of equipment and floor space, and a great deal more equipment is available for work in ceramics than if it had to be purchased especially for that purpose.

Just as the facilities became available, however, the enrollment began to decrease materially. As the Army and Navy program began to expand in the University, the Physics Department, which had to offer elementary physics courses for all Army and Navy branches on the campus, found its laboratory space entirely inadequate. It therefore obtained the use of three laboratories in the Mineral Industries Building, one of which was the ceramic laboratory, thus making that unavailable for work in ceramics. At present indications this will continue at least until March, 1946.

It is anticipated that by the fall of 1946 the enrollment will be increased considerably and that the ceramic laboratory will again be available.

Up to the present, all work in ceramics was given by Dr. W. A. Koehler, assisted by graduate student assistants. In this he had to divide his time with chemical engineering teaching and research. In July, he was appointed Head of the Chemical Engineering Department, which will necessitate giving up some of the teaching work in ceramics. An expansion, however, in the ceramic division is part of the postwar plans, and accordingly one of the first steps will be to obtain a ceramic engineer who will devote his full time to teaching and research in the field of ceramics. It is hoped that the service of such a person can be obtained by September, 1946. Another postwar project is the construction of a new engineering building, and it is planned to move the work in metallurgy, now in the Mineral Industries Building, to the new building. This will provide additional space for expansion in ceramics.

As part of the work of the Engineering Experiment Station, the ceramic equipment will be available for special investigations of interest to the ceramic industries of the State, and it is planned to interest the ceramic industries in these facilities.

Before the war, extension classes in ceramics were held at Newell, W. Va., and it is planned to continue and expand this work.

* See the October, 1942, *Bulletin*, pp. 229–31.

W. A. Koehler

OHIO CERAMIC INDUSTRIES ASSOCIATION ANNUAL FALL MEETING

The Annual Fall Meeting of the Ohio Ceramic Industries Association will be held Friday and Saturday, November 2 and 3, 1945, at The Ohio State University, Columbus, Ohio.

A fine technical program covering whiteware, heavy clay products, and refractories is being prepared.

Friday, November 2

On Friday morning, there will be a General Session for all attending. In the afternoon, there will be group meetings for those interested in whiteware, structural clay products, and refractories.

At 5:00 P.M. Friday afternoon, The American Ceramic Society is inviting all who attend the O.C.I.A. Meeting to a reception given in their offices at 2525 North High Street, in honor of the President of The Society, C. Forrest Tefft of The Claycraft Co., Columbus, Ohio.

Saturday, November 3

On Saturday morning, there will be another General Session, with topics discussed which will be of interest to all ceramists.

On Saturday afternoon, members of O.C.I.A. will attend, en masse, the football game between Northwestern University and Ohio State University. A block of 150 seats has been reserved for members.

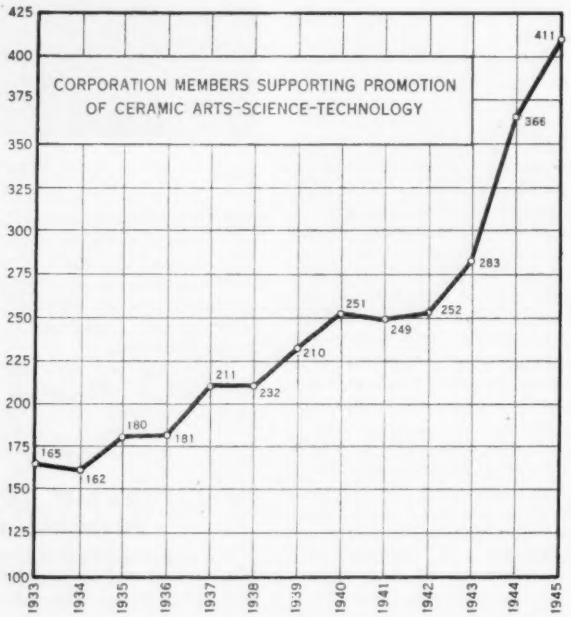
SCIENTIFIC PUBLICATIONS

The American Ceramic Society publishes the reports of scientific research for the ceramic industry. This is one of the main purposes in the organization and operation of The Society.

Corporations engaged in ceramic manufacturing and marketing must be sure that their employees are kept thoroughly acquainted with the scientific developments of the industry. Ceramic manufacturers must be apprised of the latest technical research work.

This is one of the reasons for the rapid growth in Corporation Members. The chart below shows how this class of membership has increased.

Officers of corporations realize the value of the publications of The American Ceramic Society.



PAID MEMBERSHIP AND SUBSCRIPTION RECORD

Date of Record	Members Paid		Deferred	Subscriptions	Monthly Sales	Total Circulation
	Personal	Corporation				
September 21, 1944	2246	389	2	601	220	3458
December 21, 1944	2317	402	2	661	220	3602
July 21, 1945	2388	414	3	628	220	3653
August 21, 1945	2416	416	3	643	220	3698
September 21, 1945	2449	417	2	654	220	3740
12-mo. % increase	9.0%	7.2%		8.8%		8.2%

NEW MEMBERS IN SEPTEMBER

Corporation

LABORATORIO QUÍMICO NACIONAL, Jorge Ancizar-Sordo (voter), Ministerio de Minas y Petróleos, Apartado 2577, Bogotá, Colombia, S. A.

Personal

BRANDT, NEILL M., 123 North Ave., Webster, N. Y.; Bausch & Lomb Optical Co.

CARLÉN, SÖLVE, Gibraltargatan 40, Gothenburg, Sweden; Chalmers University of Technology.

*DAILEY, E. W., 917 Walnut, Chillicothe, Mo.

DIETERT, HARRY W., 9330 Roselawn Ave., Detroit 4, Mich.; manufacturer of testing equipment.

*ECHAVARRIA, NORMAN, Loceria Colombiana, Medellin, Colombia, S. A.

EWERTZ, HENRY, 53 Albert Ave., Aldan, Clifton Heights, Pa.; potter and teacher.

FERRELLY, FRANK, Calicut, Malabar, South India; general manager, Commonwealth Trust, Ltd.

FINLAYSON, K. G., 1334 West 68th St., Los Angeles 44, Calif.; pottery manufacturer.

GADD, HARRY A., Canadian General Electric Co., Ltd., Peterborough, Ontario, Canada; superintendent, Porcelain Dept.

GAYLORD, ETHLYN B., 122 E. Linda Vista Ave., Alhambra, Calif.; owner and manager, Gayet Studios.

HAECKER, LT. ARTHUR J., JR., 510 Tebeau St., Waycross, Ga.

HENRY, GEORGES, 41 Quai de Brabant, Charleroi, Belgium; glass engineer.

ISRAEL, MARY ELIZABETH, 6203 A Malabar, Huntington Park, Calif.; teacher, Los Angeles City School.

JORDAN, RUSSELL K., Westinghouse Electric Corp., Derry, Pa.; general foreman.

*KOVACS, JOHN, R. D. 29, Mountainside, N. J.; Mountainside Art Pottery.

LETORT, MARC YVES, 16 Rue Lalo, Paris 16, France; ceramic engineer.

*LONG, BERNARD, 8 rue de Copenhague (8e), Paris 8, France; director, General Committee for Organization of the Glass Industries.

MCDERMOTT, JAMES J., JR., 80 William St., New York 7, N. Y.; Owen-Illinois Glass Co.

MIES, DORIS RAE, 701 N. Hidalgo Ave., Alhambra, Calif.; ceramic assistant, Gayet Studios.

NEELY, HOMER E., JR., 818 Mifflin Ave., Wilkinsburg, Pa.; Pittsburgh Plate Glass Co.

PAULING, JUNE A., 633 N. Sycamore Dr., San Gabriel, Calif.

REENTS, HILDRED, 1149 E. Palm Ave., San Gabriel, Calif.; producer of ceramic figures.

RUCK, THOMAS F., 52 East 3rd St., Corning, N. Y.; Corning Glass Works.

RYAN, ROSEMARY, 2405 Glendale Blvd., Los Angeles 26, Calif.; Gara Ceramics.

SANFORD, RALPH L., Gaston Place, R. D. 2, East Liverpool, Ohio; Continental Kilns, Inc.

SCHWEIG, BRUNO F., 20 Muswell Ave., London, N. 10, England; consulting chemist.

SHRODER, THERESA, 6681 Fountain Ave., Hollywood 28, Calif.; owner of ceramic studio.

*SPENCE, C. F., 343 Wood St., Mansfield, Ohio; Westinghouse Electric Corp.

STEVENTON, HORACE, Cledford Works, Middlewich, Cheshire, England.

STOCKTON, MARION B., 909 Gaffey Place, San Pedro, Calif.; ceramist and teacher.

WALKER, HOWARD E., Owens-Corning Fiberglas Corp., Newark, Ohio; melting research engineer.

*WARD, GEORGE V., South Shore, Ky.; Charles Taylor Sons Co.

WOOD, KENNETH O., 3140 Live Oak St., Huntington Park, Calif.; president, Wallace China Co.

YU, EDWIN P., Victor Insulators, Inc., Victor, N. Y.; National Resources Commission of China.

* Indicates former member of The Society rejoining.

Student

Fieldston School, New York: THOMAS P. VOGL.
Pennsylvania State College: WILLIAM J. RABIN.
Rutgers University: JAMES E. NEAL.
University of Illinois: WILLIAM A. GRAFF AND EARL R. SMITH.
University of Southern California: ELEANOR FLITTNER.
University of Toronto: THOMAS A. GREENING.

MEMBERSHIP WORKERS' RECORD

CORPORATION: Office 1.

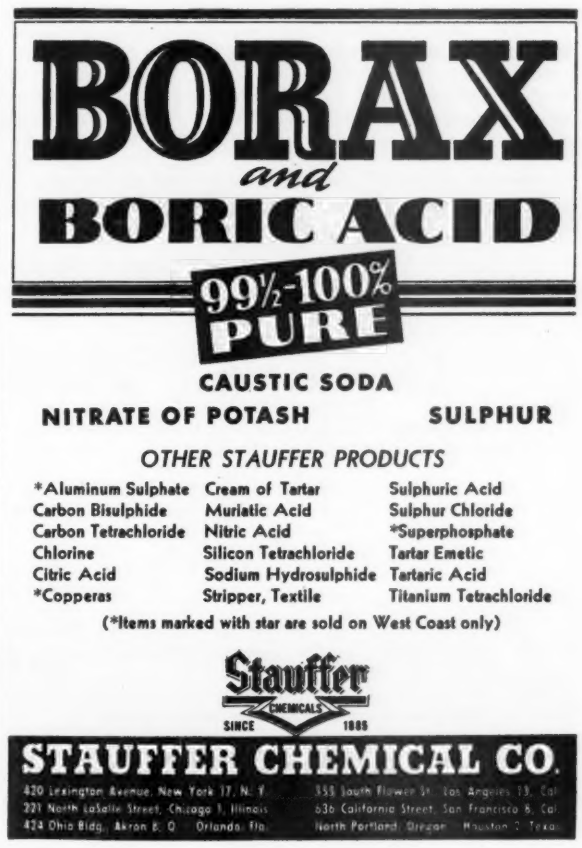
PERSONAL: C. S. Chaffee 9, E. G. Couch, Jr. 1, P. E. Cox 1, Andrew Dingwall 1, Howard Failmezger 1, J. W. Hepplewhite 1, F. R. Hohmann 1, Otis L. Jones 1, N. J. Kreidl 1, R. Lambert 1, E. J. Lewis 1, L. L. Long 1, R. Russell, Jr. 2, W. E. S. Turner 2, G. Wurtsbaugh 1, Office 9.

STUDENT: A. I. Andrews 1, C. S. Chaffee 1, E. C. Henry 1, R. J. Montgomery 1, W. L. Stafford 1, Office 2.

GRAND TOTAL: 42.

OHIO CERAMIC INDUSTRIES ASSOCIATION

In an article under the Ohio Ceramic Industries Association in the September, 1945, *Bulletin*, p. 348, entitled "Ellis Lovejoy Honored," it was erroneously stated that the classification of Honorary Life Membership had been created especially for this occasion. This same class of membe ship was confe red on Ross Coffin Purdy, General Secretary of The American Ceramic Society, October 9, 1926.



★ LETTERS FROM SERVICEMEN ★

San Francisco, Calif.,
22 August, 1945

Dear Ross:

Just a few lines to give you my change of address.

I was one of the few that was redeployed direct from the ETO to the Pacific. I am now stationed in Manila. Not a bad place to be but not like home.

With the end of the war I know that there are many ceramic engineers like myself anxious to get back to their work. I feel that we have a field of opportunities open to us if we take advantage of them.

There isn't much news from here now. I just wanted to thank you for your letters and give you my new mailing address.

Sincerely,

RALPH V. LAWRENCE,
Captain, U. S. Army

★

Sioux City, Iowa,
22 August, 1945

Gentlemen:

In reference to your letter of June 6, 1945, I wish to inform you that within ten days I will be on my way to Fort Dix, N. J., to be discharged from the Army. I plan to do part-time graduate work in ceramics while working in some branch of the field. Since school will be starting soon, I would like to make my contacts immediately. Could you please send me a list of progressive companies where I might make such arrangements?

I graduated from The Pennsylvania State College in June, 1941, with a B.S. in ceramics. After spending nine months as a computer of ballistic tables for the Aberdeen Proving Grounds, I was inducted into the Army. Eleven months later, I was commissioned a second lieutenant in the Army Air Corps as a photographic laboratory commander. My first assignment was the testing of photographic equipment at the Air Corps Proving Ground Command. Here I directed testing and wrote reports on service tests required for Air Force approval of photographic equipment. In March, 1944, I went to Italy after receiving photographic intelligence training at the Air Intelligence School. I returned in May, 1945, and was assigned as staff photographic interpretator at this base.

I am anxious to get into my chosen field and would appreciate any help you may be able to offer.

Sincerely,

WILLIAM S. NETTER,
First Lieutenant, Army Air Corps

★

Camp Beale, Calif.,
23 June, 1945

Dear Sir:

Will you please send me any vocational guidance material and information on ceramics.

Sincerely,

GERALD SCHOENBRUN,
Private, U. S. Army

★

Memphis, Tenn.,
27 August, 1945

Dear Sirs:

I will be released from active naval service in the near future and am preparing to engage in the manufacture of highly specialized new art pottery items.

May I ask for information as to where I can locate complete information descriptive of crystalline glazes.

I own a copy of Literature Abstracts of Ceramic Glazes by Koenig and Earhart, which gives a synopsis of approximately twenty-one sources of literature on this type of glaze in which I am deeply interested. A more complete treatise is desired.

One manuscript abstracted is "Cultivation of Crystals on Glazes" by J. W. Mellor, *Trans. English Ceram. Soc.*, Vol. 36, p. 13 (1936–37) and I would like to locate same.

Another example is a book referenced as A. B. Searle's Glazer's Handbook, 2d edition. Would this book likely have a complete treatise on crystalline glazes?

I will appreciate information you may have on how I may locate the above information, and if a fee is in order to assemble such data I have no objection whatever to meeting same.

Yours truly,

E. A. MORROW,
Lieutenant, U. S. Navy

BRONZE STAR MEDAL AWARDED TO CAPTAIN KNECHT

Ray G. Caruthers, Vice-President of the Universal Sanitary Mfg. Co., New Castle, Pa., has kindly sent us the following information concerning Captain A. O. Knecht, a member of The American Ceramic Society since 1938.

Before entering the service, Captain Knecht was on the staff of the Camden Pottery, a division of the Universal Sanitary Mfg. Company in Camden, N. J.

New Castle, Pa.,
August 27, 1945

Gentlemen:

We are proud and happy to announce the Bronze Star Medal citation awarded our ceramic engineer, Capt. Al O. Knecht, as officially published in an Army bulletin dated July 24, 1945.

> ALBERT O. KNECHT, Captain, 320th Glider Field Artillery Battalion, for heroic conduct in action on 18 September, 1944, near * * * GERMANY. After landing in enemy-held territory five miles from the designated landing zone, under severe anti-aircraft and small arms fire before and after landing, Captain KNECHT moved fearlessly among the crashed gliders, aiding the injured, supervising unloading and organizing his group in a defensive position. He made a personal reconnaissance of the unfamiliar territory, then led his men after dark through the hostile positions and the enemy-held town of * * *, dispersing three German patrols en route, and rejoined his battalion without losing a single man. Captain KNECHT's courageous initiative and inspiring leadership reflects the highest credit on himself and the Airborne Forces of the United States Army. Entered military service from NEW JERSEY.

Captain Al has really served his country and us the hard way. He went in with the first invasion at Casa Blanca, thence to Sicily and Salerno, returning to England to ready up his glider troops for the forthcoming D-Day invasion.

The incident of Al being blasted out of his glider only got him to the ground sooner to start belligerent action with the stinky Krauts. Against his will he was returned to England for hospitalization and there spent a few weeks' respite planning how he was going to maneuver the Boche into a pocket when he again returned to the scene of action.

Al's foregoing citation will illustrate how thoroughly a man can do his job, and we salute Captain Knecht and his men for the outstanding job they have performed for us in bringing a quick victory over Nazi Germany.

Now we are hoping for Al's release to resume a key position within the Universal organization (now coast-to-coast in its sphere) and in turn to teach us how to attack our postwar experiences with organized and fearless courage. But first we will see that Al gets his pillowed rest.

RAY G. CARUTHERS, *Vice-President,*
Universal Sanitary Mfg. Company

INSTITUTE OF CERAMIC ENGINEERS

Executive Committee, 1945–1946

President: T. A. KLINEFELTER, Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.
Vice-President: C. M. DODD, Iowa State College, Ames, Iowa.
Secretary: ROBERT TWELLS, Electric Auto-Lite Co., Spark Plug Div., Fostoria, Ohio.
Past-President: M. F. BEECHER, Norton Co., Worcester, Mass.
Trustee Representative: H. M. KRANER, Bethlehem Steel Co., Bethlehem, Pa.

REPORT OF COMMITTEE ON CLASSIFICATION AND NOMENCLATURE

During 1944–1945, the Committee on Classification and Nomenclature cooperated with The American Ceramic Society Committee in the preparation and consideration of definitions for the following terms: "ceramics," "ceramic," "ceramic technology," "ceramic engineering," and "ceramic art."

During the year, your Committee cooperated by submitting a number of criticisms and suggestions for the improvement of the wording of these definitions and is happy to report that the definitions have been accepted as tentative definitions by the Committee on Classification and Nomenclature of The American Ceramic Society and by the Board of Trustees.

The definitions were published in the minutes of the meeting of the Board of Trustees held December 8, 1944, and are set forth on page 26 of the January, 1945, issue of *The Bulletin of The American Ceramic Society*. It is believed, therefore, that there is no need for including them in this report.

Of especial interest to the Institute is the definition of "ceramic engineering." The original definition was developed by the Institute at the request of the Engineers' Council for Professional Development, which is used in accrediting all departments of ceramic engineering. This definition was accepted with minor changes in wording to comply with the dictionary-type terminology around which all of the definitions for The Society are being written. A second minor change, not affecting the major phraseology, was made to improve the clarity of the definition.

—G. H. SPENCER-STRONG, *Chairman*

See the September, 1945, Bulletin, pp. 329–34, for other Institute Committee reports.

NEW MEMBERS AND ADVANCEMENTS

Member Grade

GEORGE BLUMENTHAL, Box 224, Trenton, N. J.
J. O. EVERHART, Engineering Experiment Station, Ohio State Univ., Columbus 10, Ohio.
ROBERT GALBRAITH, Electrochemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
ROY A. HORNING, Armstrong Cork Co., Lancaster, Pa.
TAINE G. MCDOUGAL, A C Spark Plug Div., General Motors Corp., Flint 2, Mich.

Junior Grade

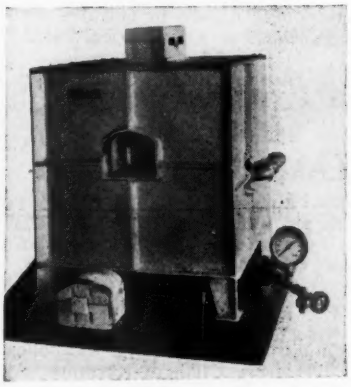
LT. (jg) J. JOHN BROUK, Naval Research Laboratory, Washington 20, D. C.
HERBERT A. DESAIX, Babcock & Wilcox Co., Bayonne, N. J.
O. J. WHITTEMORE, JR., Massachusetts Institute of Technology, Cambridge 39, Mass.

Advancements to Member Grade

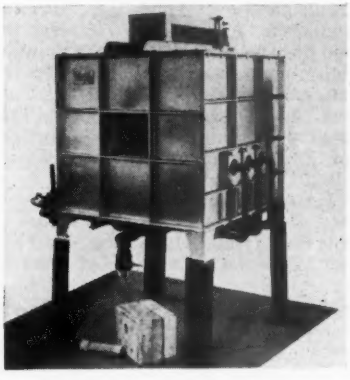
CARL H. RAPP, Globe-Union, Inc., Milwaukee 1, Wis.
RICHARD O. LANE, Macklin Co., Jackson, Mich.

REMMEY LABORATORY KILNS

No. 2150



No. 2320



6½" x 4½" x 4½" high	**SETTING SPACE**	18" x 12" x 9" high
City, Natural or Propane Gas	**FUEL**	City, Natural or Propane Gas
1200°F. to 3200°F.	**TEMP. RANGE**	1200°F. to 3200°F.

No. 2150 (small kiln) For the laboratory that must get results rapidly.
No. 2320 (larger kiln) For burning large Specimens or quantities of samples.
Both kilns are capable of burning any kind of ware, economically, over an extremely wide temperature range.

Dependable Refractories

RICHARD C. REMMEY SON CO.

Hedley Street and Delaware Ave. PHILADELPHIA 37, PA.

PERSONAL NOTES

PROMOTIONS AT CORNING GLASS WORKS

Walter E. Smith, manager of the Corning Glass Works' Pressware Plant in Corning, N. Y., has been appointed chief engineer for furnaces in the Glass Technology Department. Clifford M. Heller, former plant machine-shop manager, has been named to succeed him as plant manager at Pressware.

Mr. Smith will take up his new duties about the first of next year upon his return from a thirteen-week training course in modern management at the Harvard University Graduate School of Business Administration. As chief engineer for furnaces, he will supervise the design and construction of all furnaces throughout the Corning Glass Works' nine plants and twelve subsidiary and affiliated companies, including Corning Glass Works of South America and Corning Glass Works of Canada, Ltd. In the past seventeen years, Mr. Smith, who received his degree in electrical engineering at Ohio State University, Columbus, Ohio, has held various positions in the engineering and production departments at the company's Main, Pressware, and Parkersburg, W. Va., plants. He was production manager at Parkersburg in 1942 and assistant manager at Pressware from 1943 until January, 1945, when he became plant manager.

Mr. Heller was engaged by Corning Glass Works early in 1945 to do special assignments on methods engineering and scheduling and expediting of production at the Pressware Plant. He went to Corning from Union City, N. J., where he was chief mechanical engineer at the Elastic Stop Nut Corporation. Mr. Heller has had wide experience in the tool, die, and special machine field. Last May, he was made manager of the Pressware machine shop and was placed in charge of the manufacture of molds and other machine parts in addition to the scheduling of all shop operations.

C. G. HARMAN WITH LOCKE INSULATOR CORPORATION

C. G. Harman, formerly assistant professor of ceramic engineering at the University of Illinois, Urbana, Ill., has accepted a position as ceramic engineer with the Locke Insulator Corp., Baltimore, Md.

Dr. Harman received his B.S., M.S., and Ph.D. degrees in ceramic engineering at the University of Illinois. He has held positions at the Standard Sanitary Manufacturing Company, the Iowa Engineering Experiment Station and Department of Ceramic Engineering, a cooperative project between the Illinois State Geological Survey and the Department of Ceramic Engineering, and has been on the staff of the Department of Ceramic Engineering at Illinois since 1936.

Dr. Harman has published about twenty-five technical papers. He is a member and Fellow of The American Ceramic Society and also a member of Sigma Xi, S.P.E.E., and the Mineralogical Society of America.

J. F. G. HICKS IN BRAZIL

John F. G. Hicks, a member of Corning Glass Works' Glass Technology staff, has gone to São Paulo, Brazil, to become technical and scientific consultant for Brazil's leading glass-manufacturing company, Cía. Vidraria Santa Marina, an affiliate of Corning Glass Works of South America.

Dr. Hicks joined the Corning Glass Works' Research Laboratory staff in 1938 as a physical chemist and was assigned the problem of developing new methods for the manufacture of optical glass. These methods had been developed to a stage where commercial production was possible as the war demands for optical glass developed. Dr. Hicks continued on this work until November, 1943, at which time he was granted a leave of absence to join the large group of scientists engaged in the development of the atomic bomb.

Dr. Hicks headed a group of research chemists in one of the divisions which was directed by Harold C. Urey at Columbia University. Later on, when the stepped-up schedule and rapidly moving developments made it necessary to maintain constant contact and rapid exchange of information between research and production, Dr. Hicks acted as liaison officer between his divisional research laboratory in New York and the production plant and laboratory in Oak Ridge, Tenn.

Dr. Hicks returned to Corning in February, 1945, and since that time had been preparing for his South American assignment, which will take at least a year.

E. B. READ ELECTED TO SIGMA XI

Edgar B. Read, a member of the research staff of the Division of Industrial Cooperation of the Massachusetts Institute of Technology, Cambridge, Mass., has been elected to membership in the honorary scientific society, Sigma Xi, by the M.I.T. branch of that society.

Mr. Read received his bachelor's degree from Kenyon College in 1919. From 1923 to 1927, he was employed by the Carnegie-Illinois Steel Corporation and the Atlas Crucible Steel Company. In 1927, he was appointed a Fellow on the Refractories Fellowship of Mellon Institute, Pittsburgh, Pa., holding that position until 1944, when he became a member of the M.I.T. staff. His work there has been part of the Manhattan Project on Atomic Bombs.

Mr. Read is a member of the Sub-Committee on Analysis of the Committee C-8 on Refractories of the American Society for Testing Materials. He has been a member of The American Ceramic Society since 1931 and served as a member of the Refractories Division Program Committee in 1943–1944.

Publications

(1) (With W. R. Kerr) "Determination of Iron Oxide and Titania in Clay Refractories," *Jour. Amer. Ceram. Soc.*, **11** [11] 845–50 (1928).

(2) "Flux for Chemical Analysis of Fused Alumina Refractories," *ibid.*, **13** [12] 941–43 (1930).

(3) "Determination of Alkalis in Silicates with Special Reference to High-Alumina Refractories," *ibid.*, **18** [11] 341–46 (1935).

(4) (With T. L. Hurst) "Survey of Literature on Slag Tests for Refractory Materials," *ibid.*, **25** [11] 283–94 (July 1, 1942).

WILLARD EDISON PALMER

Willard Edison Palmer was born June 9, 1906, on a farm near Guernsey, Ohio. He attended country and village schools and was graduated from high school at Newcomerstown, Ohio, in 1924.

Following a year with the James B. Clow Foundry Co., at Newcomerstown, he enrolled at Ohio State University, from which he was graduated in 1929 with the degree of Bachelor of Ceramic Engineering. While in college he was active in the Engineering Council, Keramos, Alpha Chi Sigma, and the Student Branch of The American Ceramic Society.

Following graduation and a short period with the Universal Clay Product Co., Uhrichsville, Ohio, he was employed, in 1929, as assistant and later as ceramic engineer with Taylor, Smith & Taylor Co., Chester, W. Va., manufacturers of high-grade white and Lu-Ray Pastel dinnerware, with whom he is at present associated.

Mr. Palmer was granted the Professional Degree of Ceramic Engineer at Ohio State University in 1941 and is a registered Professional Engineer in Ohio. He has served

Willard E. Palmer

as president of the East Liverpool Ceramic Engineers Club and is at present secretary of the Research Committee of the United States Potters Association. He has been a member of The American Ceramic Society since 1934 and is a member of the Institute of Ceramic Engineers.

Publication

(1) "Influence of Flint Particle Size on Permanent Moisture and Thermal Expansion in Porous Earthenware Bodies," *Jour. Amer. Ceram. Soc.*, **25** [14] 413–16 (Oct. 1, 1942).

Patent

(1) "Decorated Ceramic Ware and Method of Making," U. S. 2,270,081, Jan. 13, 1942.

NECROLOGY

WILLIAM J. HENNESSY

William J. Hennessy, executive vice-president of the Chicago Convention Bureau, Inc., died recently of a heart attack at his home in Chicago, Ill.

Mr. Hennessy had done much to establish Chicago's reputation as the convention center of the United States. For thirty-three years he was associated with the convention activities of the Chicago Association of Commerce, which he left in October, 1944, to manage the Convention Bureau when it was established. He was the only man to serve two terms as president of the International Association of Convention Bureaus.

(1945)

Mr. Hennessy at one time had been a member of The American Ceramic Society.

WILLIAM H. FITCH

William H. Fitch, president of the Fitch Recuperator Co., Plainfield, N. J., died July 2, 1945. Mr. Fitch had been a member of The American Ceramic Society since 1942.

The Company is continuing under the management of William H. Fitch, Jr.

ENAMELERS CLUBS

EASTERN ENAMELERS CLUB

The first meeting of the Eastern Enamelers Club since wartime travel restrictions went into effect was held September 22, 1945, at the Ritz-Carlton, Philadelphia, Pa.

CHICAGO DISTRICT ENAMELERS CLUB

The first meeting of the Chicago District Enamelers Club of the autumn season was held October 13, 1945, in the Lincoln Room of the La Salle Hotel, Chicago, Ill.

After luncheon, the following program was presented:

(1) "Arc Welding and the Requirements for Porcelain Enameling" by H. M. DOWNING, welding engineer, Lincoln Electric Co., Cleveland, Ohio.

(2) "Resistance Welding Prior to Porcelain Enameling" by CLYDE G. BASSLER, Taylor Windfield Corp., Warren, Ohio.

An interesting additional feature to this program was the showing of a movie on architectural porcelain enamel by the Carnegie-Illinois Steel Corporation.

Musical entertainment concluded the program.

Future Meetings

Tentative plans have been discussed for meetings to be held December 8, February 23, and May 3. Subjects suggested for these meetings include infrared drying, automatic pickling, enamel-plant control, enameling furnaces, and low-fire finishes.

Officers and Committees for 1945–1946

President: W. W. HIGGINS, A. O. Smith Corp., Milwaukee 1, Wis.

Vice-President: W. J. PLANKENHORN, Federal Electric Co., Chicago 19, Ill.

Secretary-Treasurer: DANA CHASE, Dana Chase Publications, Chicago 1, Ill.

Assistant Secretary-Treasurer: GEORGE TUTTLE, Benjamin Electric Mfg. Co., Des Plaines, Ill.

Program Committee

C. M. ANDREWS, *Chairman*, Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.

F. A. PETERSEN, Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.

FRANK R. PORTER, Inland Steel Co., Crown Point, Ind.

W. J. PLANKENHORN (*ex officio*), Federal Electric Co., Chicago 19, Ill.

Publicity Committee

R. L. COOK, *Chairman*, Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.

G. W. HOFSTETTER, Ferro Enamel Corp., Cleveland, Ohio.

HOWARD H. MOAD, Chicago Vitreous Enamel Product Co., Cicero 50, Ill.

Membership Committee

EDWIN P. BOLIN, *Chairman*, Chicago Vitreous Enamel Product Co., Cicero 50, Ill.

WILLIAM DONALDSON, Geo. D. Roper Corp., Rockford, Ill.

RUDYARD PORTER, Carnegie-Illinois Steel Corp., Chicago 90, Ill.

NOTES FOR CERAMISTS

LARGE FELDSPAR PLANT OPENED

Described as the largest feldspar-refining plant in the world, the Carolina Mineral Company has opened its new Kona plant at the confluence of the North and South Toe Rivers in Mitchell County, North Carolina.

It is the first commercial plant using the flotation method of concentrating feldspar. Previously, feldspar has been separated from the other minerals with which it occurs by laborious and inefficient hand-sorting. Kona will recover mica and quartz as by-products.

Ore for the new plant is obtained from a pegmatite dike located a few hundred feet from the mill, but purchase from other producers is contemplated.

R. W. Lawson of Erwin, Tenn., is president of the Consolidated Feldspar Corporation, which is the parent company of the Carolina Mineral Company. Ed Boone of Spruce Pine is general manager of the Corporation, and E. W. Koenig of Erwin is general superintendent.

Designing and construction of the Kona plant has been under the direction of V. L. Mattson, Burnsville, who is chief engineer. T. C. Carson, Jr., is mill superintendent and chief chemist.

Mr. Lawson, Mr. Koenig, and Mr. Mattson are members of The American Ceramic Society.

BULLETIN FOR VETERANS

A bulletin entitled "Opportunities for Veterans at Ohio State University" has been issued and may be obtained by writing to The Ohio State University, Columbus 10, Ohio. There is no charge.

LITERATURE AVAILABLE ON TWO-METER SPECTROGRAPH

The Applied Research Laboratories, 4336 San Fernando Rd., Glendale 4, Calif., and the Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4, Mich., have prepared a four-page folder describing their new two-meter grating spectograph.

This instrument can be supplied with 36,600 lines per inch or 91,500 total grating lines, representing an unusually fine ruling. This has made possible the production of a high-dispersion unit without resorting to a bulky, long focal length. A 24-inch camera provides a 20-inch spectrogram on 35-mm. spectrum film. The camera is movable on a radius arm, which means that the operator can effect positioning along the Rowland circle so that any 20-inch portion of the total 60-inch spectrum may be photographed at one time.

BAUSCH & LOMB WAR SERVICE

Wartime accomplishments of an American industrial organization are described in a booklet issued recently by the Bausch & Lomb Optical Co., Rochester, N. Y.

The booklet, entitled "Seeing It Through," is a report to employees, servicemen, and friends on the production of optical instruments of war and their successful use on every front. Outlining the potential danger of a nation at war without self-sufficient means to supply optical glass and optical instruments, the book shows the measures taken by the Company to provide these essentials. Photos show height finders, range finders, battery commanders' telescopes, binoculars, searchlight mirrors, photographic lenses, mapping equipment, gunsights, and many other optical instruments in action.

That the performance of this Company has been high is indicated by the many awards and citations received from Government agencies and the fighting forces themselves. One of the first fourteen organizations to be awarded the Navy "E," the Company has continuously merited renewal and at present flies the Army-Navy "E" with five stars.

A. P. GREEN ADVERTISING DEPARTMENT MOVED TO ST. LOUIS

The A. P. Green Fire Brick Company has moved its Advertising and Public Relations Department from its general offices and plant at Mexico, Mo., to St. Louis, Mo., with offices in the Railway Exchange Building.

ST. LOUIS SECTION

The first fall meeting of the Local Section was held at the Forest Park Hotel October 3, 1945. Chairman H. W. Meyer called the meeting to order after the dinner.

Since Mr. V. E. Wessels has left St. Louis it was necessary to elect a new secretary. Mr. E. W. Summers of the Owens-Illinois Glass Co. at Alton was elected.

The Program Committee under Doctor Paul Herold is driving to obtain the type of speaker and subject that will arouse necessary interest to draw a large attendance at the coming meetings. This one was attended by 68 members and guests. Doctor J. C. Hostetter, president of the Mississippi Glass Co. and well known to everyone in the Society, presented two reels of film on glass in making in England. One of them included Dr. W. E. S. Turner and some views of the Department of Glass Technology at Elmfield, University of Sheffield. Since Dr. Hostetter was familiar with most of the scenes he elaborated interestingly on some of them. Mr. H. H. Hanna spied an old friend in one of the pictures.

The highlight of the evening was 1st Lt. Adolpha Meyer, a sister of the Chairman. Lt. Meyer had been with General Wainwright when he surrended at Corregidor and remained a prisoner of the Japanese for 33 months until the Americans returned. She recounted in a most sincere and unassuming manner, in a regular chronological order, their lives as internees. Nowhere could one have obtained a more true and realistic picture of the experiences of these brave people who never lost hope.

OPPORTUNITIES IN RESEARCH

Unusual opportunities in the postwar period will be available at Battelle Memorial Institute for qualified research men now in the services or engaged in war research.

This endowed industrial and scientific research institution will add a selected number of competent scientists to its staff just as rapidly as they are relieved of their war responsibilities. The men chosen will be given every opportunity to develop in their professional fields and to apply their scientific knowledge to the solution of industrial problems.

Such men will find modern scientific tools available for their use in the well-equipped Battelle laboratories, and they will be aided by a comprehensive program of fundamental research designed to expand their knowledge and their ability. Battelle operates in an unusual atmosphere which has a strong appeal to the professional research man. Opportunities for further education, technical growth, and administrative responsibility exist.

Experienced research men in the fields of chemistry, chemical engineering, electrochemistry, physics, metallurgy, fuels, light metals, plastics, ceramics, mechanical engineering, design and product engineering, electrical engineering, applied mechanics, mining, raw materials, and allied technical professions will be considered.

Whatever your postwar plans may be, inquire now about these opportunities at Battelle. Write to:

BATTELLE MEMORIAL INSTITUTE
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FLASH MELTING

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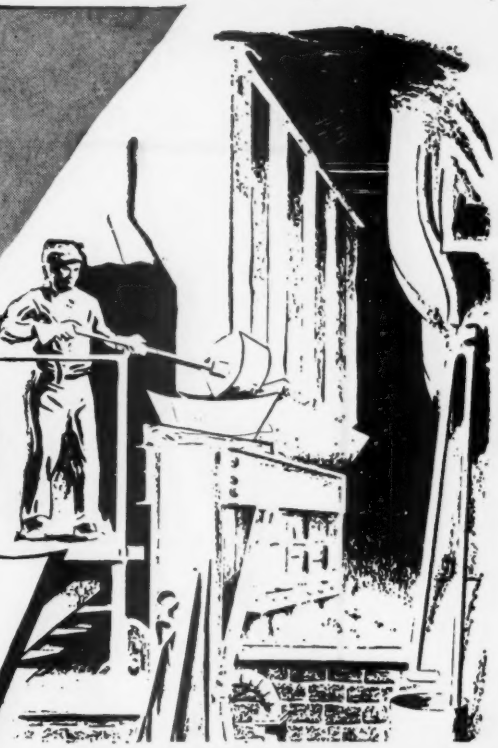
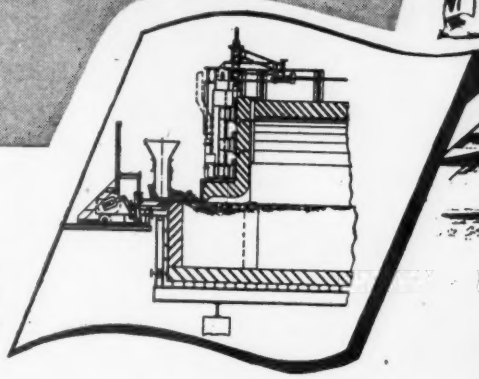
BLANKET BATCH FEEDER

is superior to





Note the shallow uniform blanket of fritted batch distributed across the melting chamber.

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25% more Glass with 10% less gross Fuel input and up to 300% increase in service life of refractories at vital points of wear . . . These percentages are glass plant production records.

The Simplex Blanket Batch Charger spreads and forwards the materials across the feed opening in a shallow uniform blanket and provides maximum exposure to the flame for faster melting. Greater exposure to the flame permits lower top melting temperatures. The Blanket Batch Feeding Method reduces radiation losses and minimizes dusting of the furnace atmosphere. Before passing into the melting chamber proper, the materials are fritted under protection of the covered charging bay to seal in the fluxing compounds and increase Thermal conductivity.

This complete assembly is mounted on wheels so it can be withdrawn from feed position to facilitate furnace repairs. Write or wire today. Let Simplex Equipment help you produce better glass.

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Illustration courtesy Square D Company

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ONCE UPON A TIME there were many reasons why the hair of enameling shop foremen turned prematurely gray. But many of the old problems confronting him in the past do not exist today.

Then, too, that is where your Chicago Vit service engineer comes in. He is your positive solution to a negative problem. He knows his enameling metals; he knows enameling methods; and he certainly knows his frits.

For proper control methods, lighter application, reduction of rework, better production, and lower costs, consult a Chicago Vit service engineer. His wealth of experience is at your command—without obligation.

FOR FINEST FRIT • CHICAGO VIT

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PACKAGE APPEAL AND TASTE SATISFACTION

IN BEVERAGE BOTTLING

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3. *SULFIDE-RESISTANCE*—unaffected by constant direct contact with foods.
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5. *EASILY APPLIED*—give smooth, even applications of exceptionally high gloss—easily adapted to the heaviest of multi-layer designs—without the troubles usually associated with heavy applications.

The latest information on colors and their applications is available to you through the Du Pont Technical Staff. For answers to specific questions, or for demonstrations of color application, write: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Delaware.

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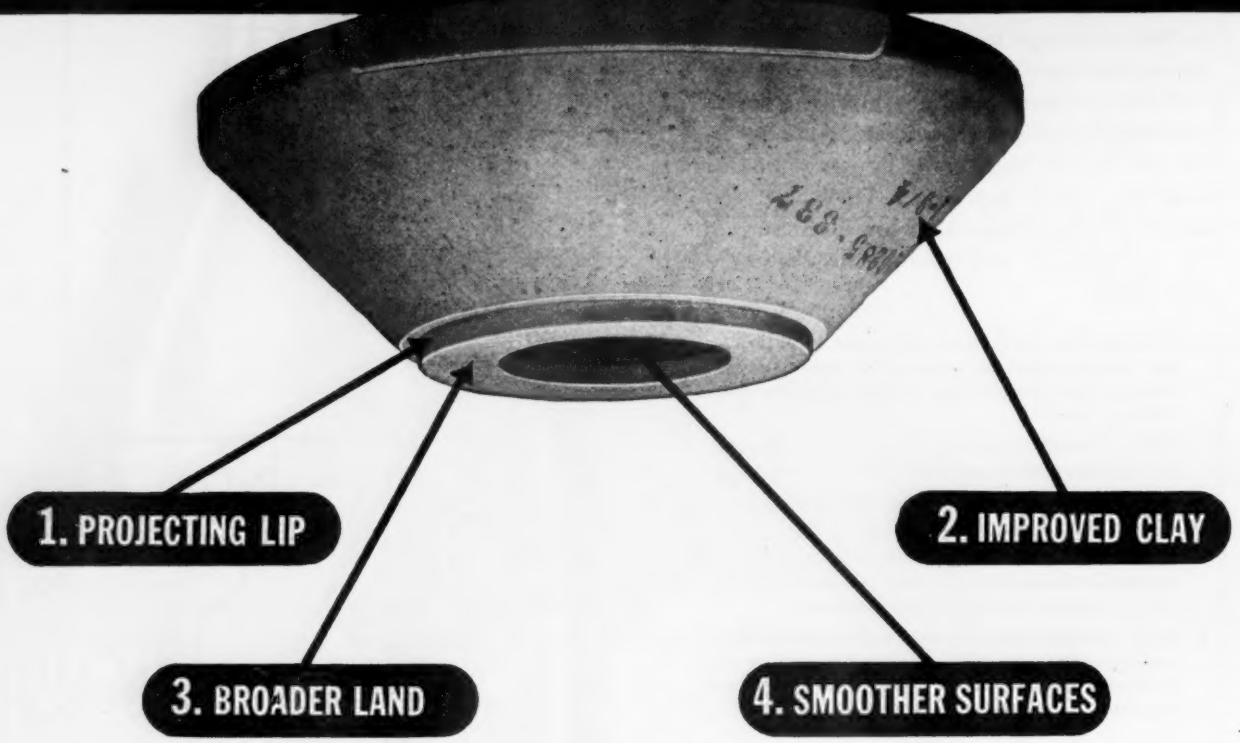
FOUR IMPROVEMENTS IN HARTFORD TYPE B ORIFICE RINGS



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1. **Lip projects 1/16" below ring holder, giving closer shear cut.**
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3. **Broader land gives more clay between flowing glass and metal ring holder, resulting in longer ring life, less chilling of glass at orifice, and greater protection of ring holder.**
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Additional features that will be appreciated by every alert plant manager include the fact that

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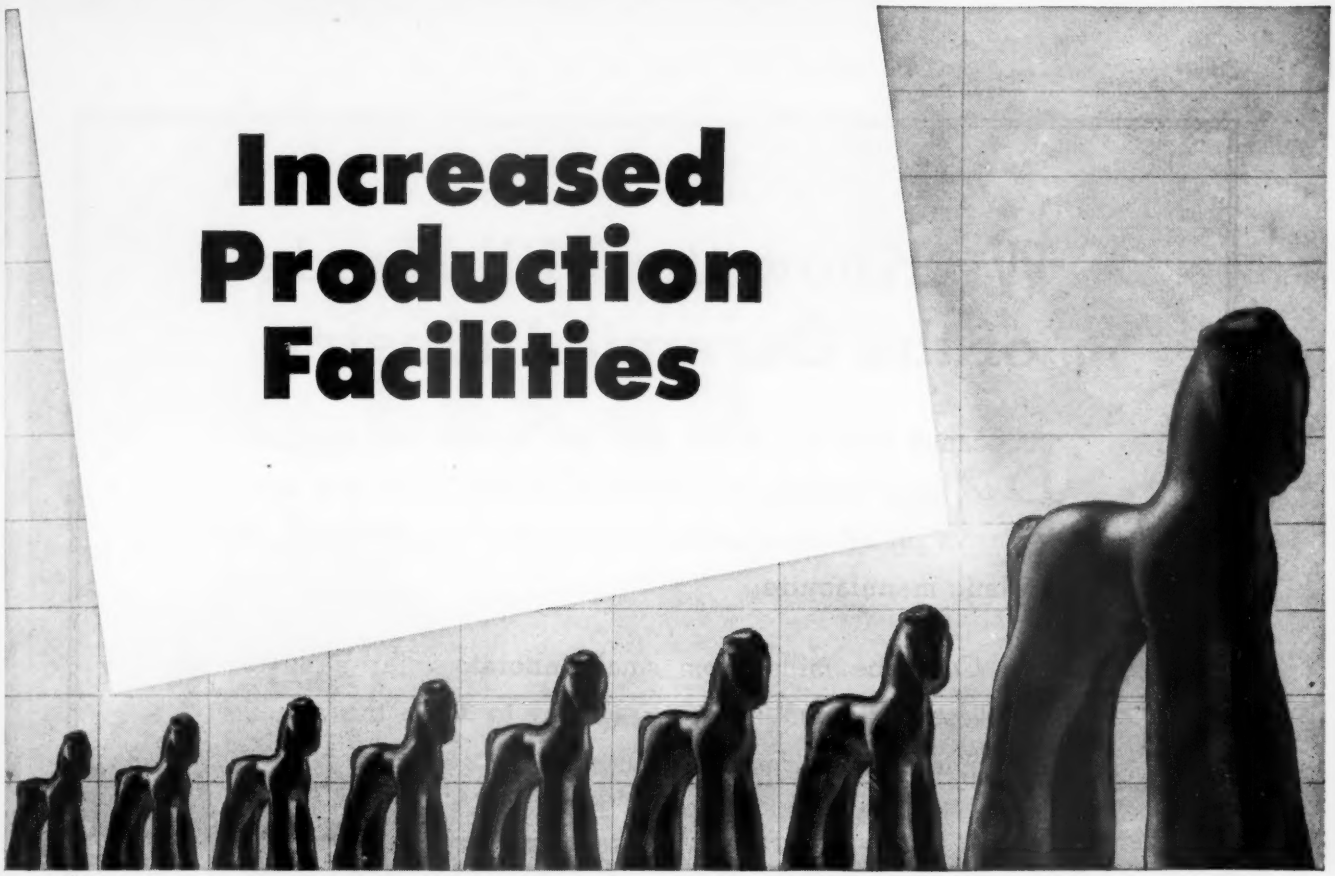

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We are doubling production. New grinding and processing equipment at the mill, another steam shovel, barge, enlarged trackage and dock facilities—will further speed deliveries.

You will find that the iron oxide content—always very low—has been still further reduced by our changeover to the flotation method of iron mineral removal. This water classification process also removes dust, which might otherwise be encountered in unloading and handling.

Remember with Lakefield NEPHELINE SYENITE you get dependable uniformity, easier melting glass and enamel batches, and in whiteware lower firing temperatures and longer firing ranges.

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HIGH ALUMINA CONTENT • IDEAL FLUXING PROPERTIES

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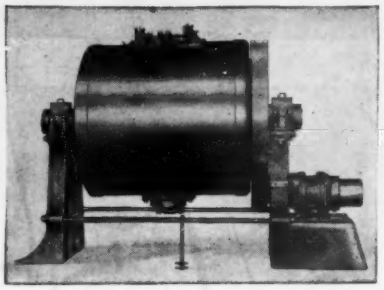
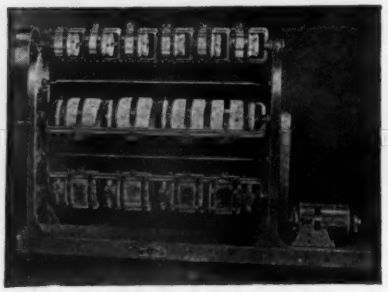
Paul O. Abbé mills, from small laboratory jar mills to huge production mills, are designed to solve the actual problems of individual customers.





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SAGGERS . .

HILLERS . .

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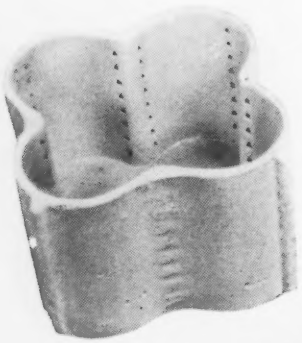

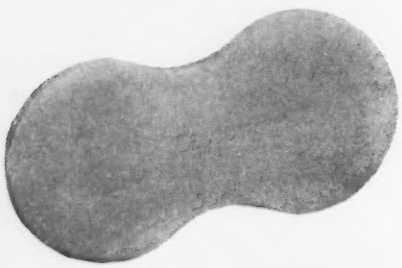

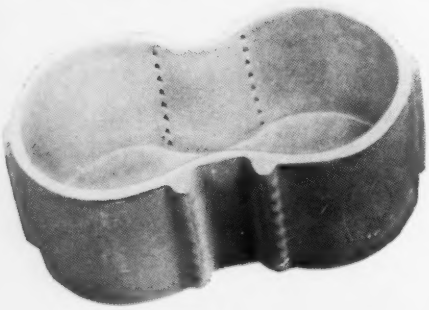

If you are looking for more *durable* kiln furniture—real tough, rugged, *thin-walled* refractories that will help reduce fuel bills and, incidentally, increase the "payload" capacity of your kilns—you'll find it here at CESCO, and in a wide variety of sizes and shapes.

CESCO Saggers, due to the development of new refractory formulas and close laboratory control at each stage of production, have exceptional strength for their weight. That's why walls and bottoms can be made thinner, *safely*. This, in turn, permits you to fire more ware in each loading, with substantial savings in time, fuel and money.

Highly resistant to thermal shock, CESCO Refractories have unusually long life. But, suppose you *try* them . . . and *prove these facts* for yourself.

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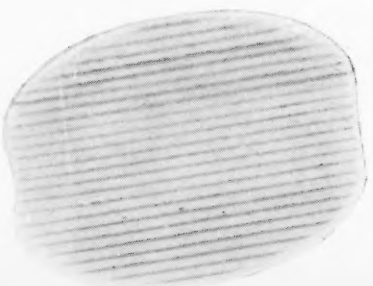

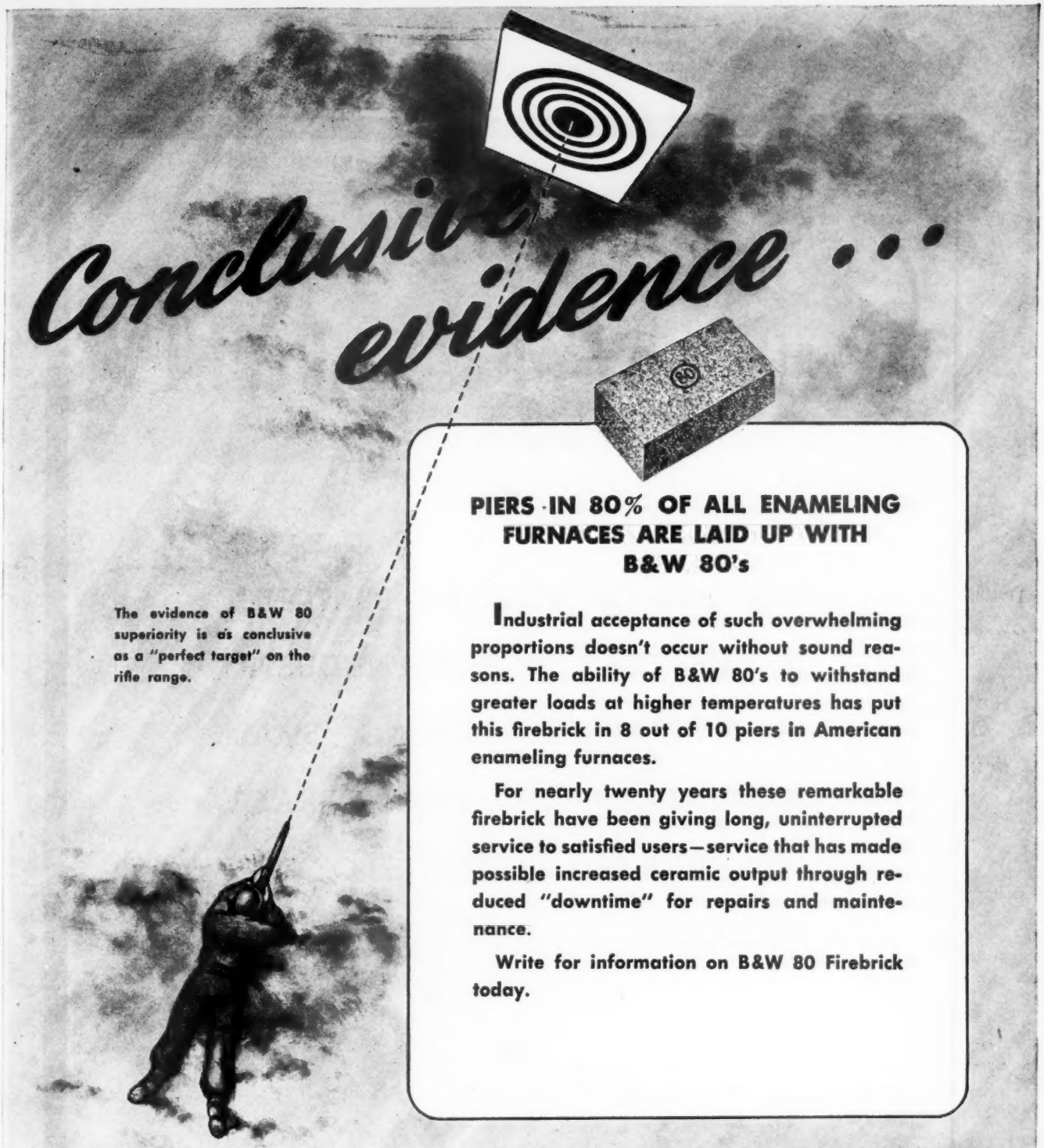

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∧ ∧ Inexpensive ORTON STANDARD PYROMETRIC CONES, used as a primary device for the control of kiln firing during this critical period provides a simple, accurate, and reproducible method to obtain the desired results.

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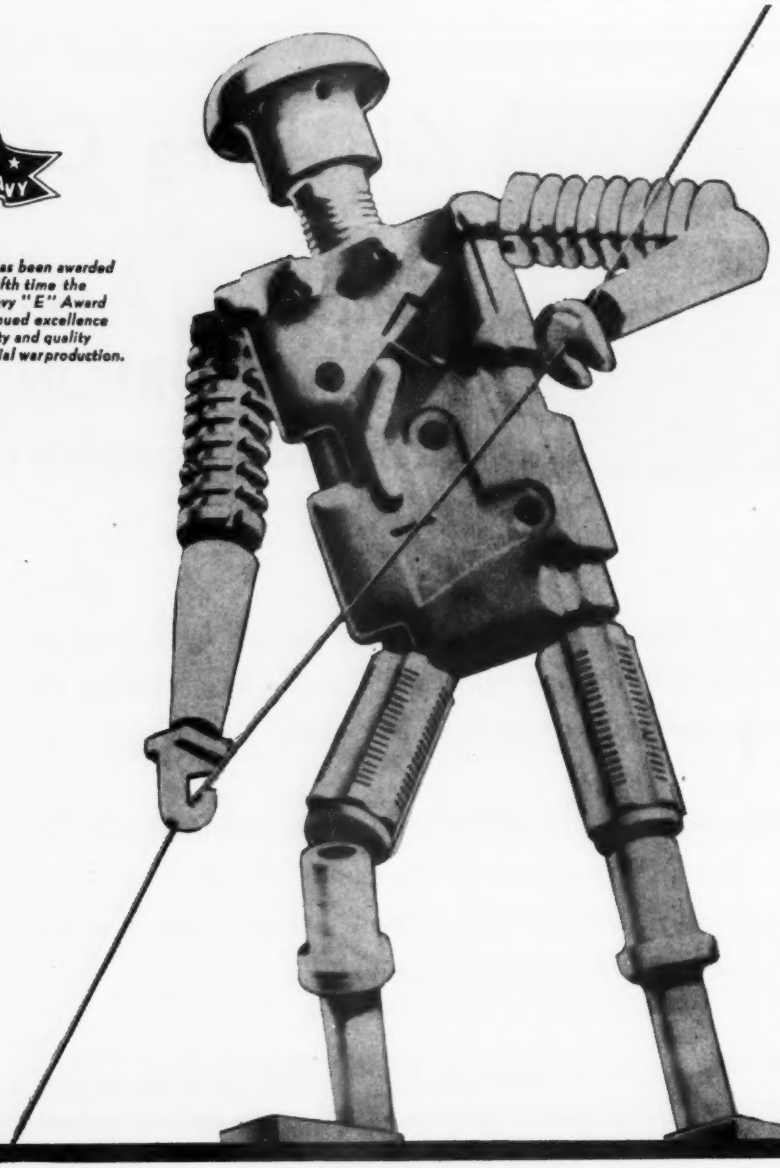

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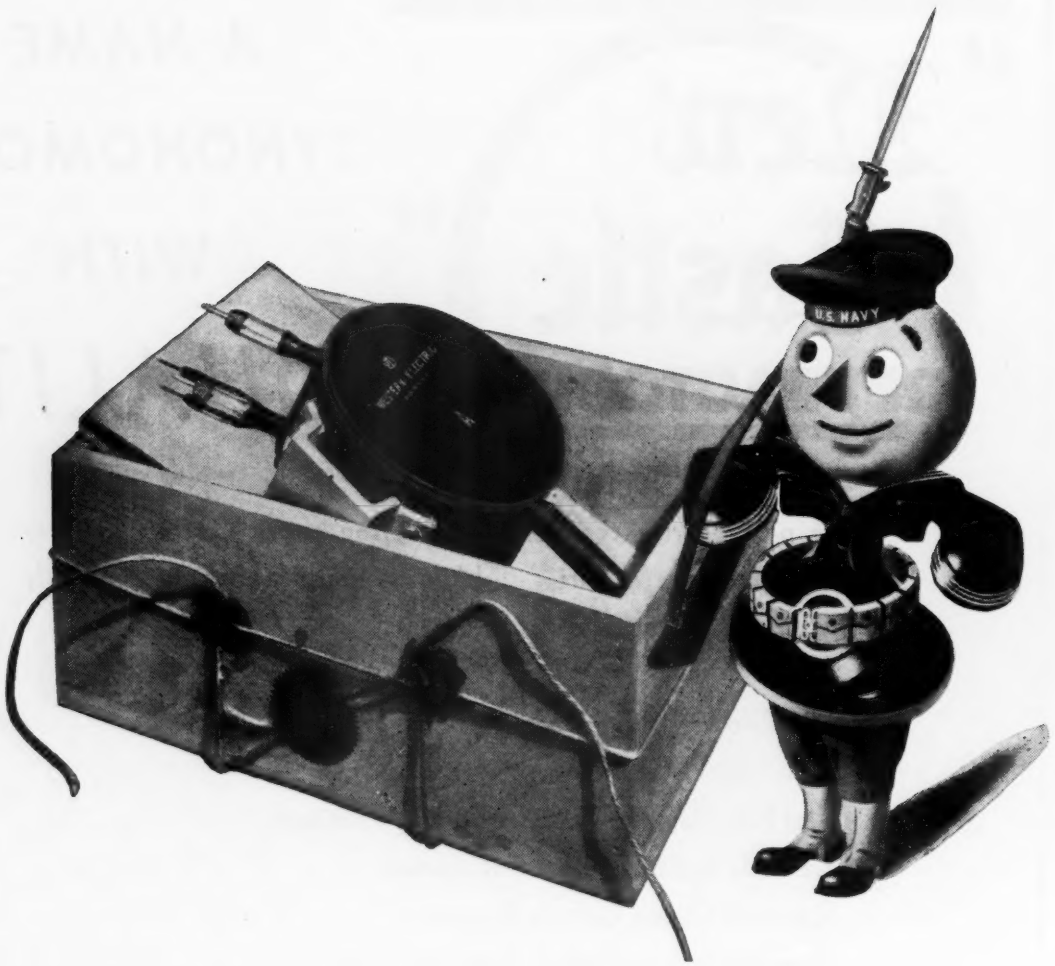

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